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JULY 2008

REVIEW OF MUTUAL RECOGNITION SCHEMES

SUBMISSION TO THE PRODUCTIVITY COMMISSION STUDY

Stainless Tanks & Pressure Vessels Pty Ltd (STPV) manufactures a range of stainless steel gas cylinders for a number of purposes, including :-

1. Mobile water based fire extinguishers, mainly for the mining industry.
2. LPG cylinders for:-
   - Boating Industry
   - Hot Air ballooning
3. Various other small pressure vessels for food processing, home brewing, water treatment, and other process applications.

These markets are quite unique, and there are very few manufacturers world wide for these products, with STPV being the sole manufacturer in Australia. Nevertheless these markets are quite important to the economy, because of the requirement for all mobile mining vehicles such as excavators, dump trucks, diamond drilling rigs, and other vehicles to be fitted with fire extinguishers.

STPV acknowledges that some of the products mentioned in this submission may be covered by exclusions, such as exceptions under the MRA, and schedule 3 under TTMRA.

STPV also acknowledges that matters dealing with the USA/AUST FTA may not be relevant to this enquiry. We would like to set out our experiences nevertheless, as this may assist the PC in understanding problems faced by manufacturers seeking access to export markets.

STPV is concerned at the variety of systems in place with which it must comply in order to market the products it manufactures.

In particular, STPV wishes to concentrate on two markets where barriers to entry are caused by the arrangements in place for recognition of the product in the country to which the goods are exported.

The Managing Director of STPV Mr. Chris Miller was funded by the Department of Industry to visit the USA in May 2007 to discuss issues relating to acceptance by the USA of LPG cylinders for the boating industry. The visit was not successful in gaining access on an economic basis.

More recently, STPV has made enquiries about export to New Zealand, and again found that despite the presence of the TTMRA, additional requirements are necessary before STPV can successfully export its stainless steel LPG cylinders to that country.

In addition, STPV has found that differences in regulations between Australian states means that the MRA is not working as effectively as it needs to in order to maximise efficiencies for Australian manufacturers.

We also believe there are some issues of jurisdiction which are not understood by importers, overseas manufacturers and some local manufacturers, which need to be addressed. In our case the issue is uncommon, which only makes it harder to know what the right path to follow is.

Attached to this submission is the report prepared following Mr Miller's visit to the USA. (see Appendix 1)

As part of his preparation for this visit, Mr Miller prepared a comprehensive table setting out differences between the relevant Australian Standards and the USA Department of Transportation (DOT) codes. A copy of this document is also attached. (see Appendix 2)

Also attached are the minutes out the meetings with DOT and ASME which set out how they approach the approval of imported products made to other standards. (Appendix 3)

Also attached is an email relating to approval processes in New Zealand. (see Appendix 4)

By way of comparison, STPV manufactures simple pressure vessels for an Australian company, which exports them as part of a complete system to the European Union. While a good deal of preparatory work, involving lots of paperwork was required for this project, STPV is able to comply with the EU regulations without any trouble.

This shows what can be achieved when the issues are clearly identified, so that the system can be designed to minimise costs for the manufacturer while ensuring the product is safe and fit for purpose in the country where it is used.

Some of these issues are inter-related, but the following details set out our position. For each issue, some suggestions are made which would help to alleviate the problem.

1. ISSUES OF JURISDICTION

STPV has one issue here which highlights the problems which can occur for an overseas manufacturer wishing to export product to Australia.

The issue relates to the Hot Air Ballooning industry, which operates in all states of Australia as well as New Zealand.

Hot Air Balloons are powered by LPG held in gas cylinders, and installed in the basket under the balloon.

These cylinders are approved for use in HABs by the Civil Aviation Safety Authority.

The cylinders require inspection and re-certification at specified intervals, normally every 10 years.

Most Balloon operators in Australia use cylinders manufactured by STPV for Kavanagh Balloons, a company based in Sydney who actually build the baskets and balloons.

STPV manufacture the LPG cylinders for Kavanagh Balloons, and also undertakes periodic inspections as required by the Australian Standard.

The other main manufacturer of balloons used in Australia is Cameron Balloons, based in the Bristol in the UK.

There are believed to be a small number of other manufacturer's cylinders in use in Australia.

Cameron Balloons have approval from CASA for the operation of their balloons in Australia, but they do not have design approval from a State Workcover Authority for the operation of the LPG cylinders.

STPV has been re-certifying their cylinders for some years, but when the lack of a design approval number was pointed out, STPV stopped re-certifying the cylinders.

Mr. Miller spoke to the Victorian Workcover Authority, who advised the cylinders needed a design approval number.

Mr. Miller advised Cameron Balloons of the situation which was unaware of this requirement.

This illustrates a jurisdictional issue which needs to be addressed.

PROPOSED SOLUTIONS

1. That the Productivity Commission discuss this situation with CASA and State Workcover Authorities with a view to having all Balloon Operators made aware of the need to comply with State Workcover regulations in relation to LPG cylinders used to power their balloons. Perhaps the Australian Ballooning Federation should also be included in these discussions

2. That balloon operators be formally advised of their obligations under State Law.
3. That Licensed Gas Cylinder test Stations be advised of the requirement that gas cylinders NOT be re-certified unless each cylinder tested is stamped with an appropriate Design registration number. This is probably best handled by working with SAI-Global which supervises these Stations. We make this suggestion because there is anecdotal evidence of hot air balloon cylinders being re-certified by test Stations who do not appear to understand the issues for these special situations. In particular, replacement fittings for these cylinders must only be of the model/brand specified by the cylinder manufacturer. Normally a Test Station would not have access to this information.

2. ISSUES OF ACCEPTANCE OF PRODUCT INTO THE USA MARKET

The advent of the Free Trade Agreement with the USA was seen as an opportunity for STPV to export its mariner LPG cylinders to the USA.

STPV has supplied these cylinders to chandleries throughout Australia for a number of years.

It also supplies cylinders to manufacturers of stainless steel barbecues who specialise in equipment for the boating industry.

Some of these manufacturers successfully export the barbecue to the USA, but ran into problems when trying to include the Mariner Gas cylinder in the package.

When STPV investigated, it found that the USA did not have a standard or code for stainless steel LPG cylinders.

In fact the Australian Standard was the first in the world to provide for stainless steel as a material, after Mr Miller who was a member of the relevant Standards committee at the time, wrote amendments to the Australian Standards AS2469, AS2470 and AS3577 which were accepted by the committee and published in about 1998.

Since that time ISO and the EU have published standards permitting the use of stainless steel, but the USA has not.

After a good deal of discussion between STPV and the Department of Industry Tourism and Resources, funding was provided for Mr. Miller, and a representative of the Pressure Equipment Association Inc, (the Australian industry association covering pressure vessel manufacture) and a member of the Standards Australia policy board to visit Washington for talks with the Federal Department of Transport (DOT) and American Society of Mechanical Engineers (ASME).

Standards Australia and the Victorian Government also contributed to this funding.

These talks took place in May 2007. The minutes arising from the meetings are attached, but essentially, the DOT attitude was that they would not accept independent third

party design verification, nor fabrication inspection, nor witnessing of testing by a body approved by NATA, or registered with JAS-ANZ.

Further they insisted on their right to send a team of their people to Australia to inspect STPV's facilities, all costs to be born by STPV.

The Australian delegation argued that the international system for mutual recognition of third party inspection and of testing laboratories should provide the USA with sufficient assurance as to product quality, but that view was not accepted by DOT.

The costs to meet DOT requirements, including business class air fares, hotel accommodation, freight of samples to the US and testing in US laboratories was such that STPV decided not to proceed.

Similar issues had been canvassed by the Australian negotiating team in drawing up the Free Trade Agreement, but it was clear to Mr. Miller that this issue was not considered of sufficient importance to jeopardise the signing of the Agreement.

PROPOSED SOLUTION

This is not an easy issue, but STPV believes that the Productivity Commission should investigate the possibility of the USA accepting the principles behind the the JAS ANZ arrangements and the International Laboratory Accreditation System.

3. ISSUES OF ACCEPTANCE OF PRODUCT INTO THE NEW ZEALAND MARKET

Similar issues to those with the USA have arisen in relation to the New Zealand market

New Zealand does not recognise Design Approvals issued by any Australian State.

The New Zealand Environmental Risk Management Authority (ERMA) requires that all pressure vessels used in New Zealand be registered and have a “LAB NO” stamped on the compliance plate attached to the vessel.

To obtain a Lab No. an Australian company has to have the design independently verified by an approved verifier, arrange for samples of the cylinders to be sent to New Zealand to be mechanically and chemically tested at an IANZ laboratory, and also arrange for each batch to be inspected in New Zealand before release for sale.

New Zealand will not accept testing being carried out by a NATA registered laboratory in Australia.

This situation exists despite the existence of the TTMRA.

Furthermore the New Zealand requirement is for every model in a range of cylinders to be tested. In Australia, State Workcover Departments will accept one verified design for a range of vessels which are all of the same design parameters. This significantly reduces the costs of compliance and testing compared to New Zealand. Furthermore the one Design Approval number can be used for all vessels in the range, whereas in New Zealand, every model has to have its own Lab No. which increases manufacturing costs and requires more complicated manufacturing procedures.

STPV understands that the New Zealand Environmental Risk Management Authority (ERMA) and a member of committee ME-002 of Standards Australia, is currently reviewing the interface between New Zealand and Australia on these issues.

STPV manufactures a range of stainless steel fire extinguishers for the mining industry and sells them to all major Fire Protection companies in Australia, a number of whom are in the New Zealand market.

STPV receives requests to export these cylinders to New Zealand, but the market is very small compared to Australia, and it is doubtful if STPV can justify the time and expense to obtain separate Lab Numbers for every size of cylinder, especially when in Australia, the one design approval number can be used for all vessels of the same diameter and working pressure, made from the same materials.

PROPOSED SOLUTION

STPV suggests that the PC contact the ERMA in New Zealand to discuss the issues raised in the preceding paragraphs, with a view to putting in place simpler systems which reduce costs for manufacturers, but which give the responsible authorities in the country of destination a high degree of assurance regarding public safety.

In particular a standard method of approaching designs with the same materials, diameter and contents would simplify matters greatly on both sides of the Tasman.

Acceptance of Nationally accredited testing laboratories would also be of great benefit.

4. ISSUES OF LACK OF UNIFORMITY OF APPROACH BETWEEN STATES IN REGARD TO OHS MATTERS.

The aim of the National Standards for Plant is to ensure the elimination of duplication of areas such as Design Approvals of Hazardous Goods, such as pressure vessels, and gas cylinders.

However for many years manufacturers of pressure vessels and gas cylinders have had to contend with

Design Approvals obtained in one State not being accepted in another State.

This has led to a situation where manufacturers go to the State whose design approvals are most widely accepted throughout Australia.

For instance, although STPV is located in Melbourne, we always send applications for design approvals to New South Wales because approvals obtained in Victoria, until recently were not accepted in NSW.

We understand that there have been some improvements in arrangements between Victoria and New South Wales, but we feel the PC should review these matters anyway.

Manufacturers have had to keep up to date with regulations in each State to ensure design approvals are appropriate for (a) the application and (b) the State of installation and use.

In addition, it can take up to 2 months to get a Design Registration number from a State Workcover Authority, after having the design verified by an authorised private verifier. This can take 2 to 3 weeks. We have difficulty understanding why it takes so long to obtain the Design Registration number when the actual work of checking the design is done by a private contractor usually in much shorter time.

This is a remarkable situation in such a small population as Australia, which must compete with manufacturers who only have to comply with one set of regulations for the whole of the European Union, a population of over 400 million, and another for the USA, where some States are bigger than the whole of Australia in population.

STPV notes the program of reform announced by the Commonwealth Government in relation to harmonisation of OHS matters. STPV also notes the section on page 18 of the Issues Paper.

However, STPV also notes that such proposals have been around for many years, but the substance always seems unable to match the rhetoric.

STPV hopes the current moves will be more productive.

PROPOSED SOLUTIONS

1. THAT THE PC COMPARE THE SYSTEMS FOR REVIEW OF PRESSURE VESSEL DESIGNS BY EACH STATE TO ENSURE THAT THE SYSTEMS ARE ACCEPTABLE AUSTRALIA-WIDE, REGARDLESS OF THE STATE WHERE THE DESIGN WAS NOTIFIED.

ENDS

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REPORT ON VISIT TO USA FOR DISCUSSIONS WITH (1) D.O.T AND (2) A.S.M.E.

MEMBERS OF PARTY:
1. Chris Miller Managing Director Stainless Tanks & Pressure Vessels Pty. Ltd. (STPV)

2. Pressure Equipment Association Inc (PEAI)

3. Australian Institute for the Certification of Inspection Personnel.(AICIP)

4. Embassy of Australia, Washington, D.C., USA.

This report is circulated to:

Commonwealth Department of Industry Tourism and Resources
Victorian State Department of Innovation, Industry and Regional Development
Standards Australia
Pressure Equipment Association Incorporated.

This report does not address the matters discussed with the representatives of ASME. This will be the subject of a separate report by the other members of the party.

BACKGROUND

Clauses dealing with mutual recognition of standards and codes are normally a part of Free Trade Agreements. (FTA)

In the case of the Australia-USA FTA, Article 8.5 provides for each country to give positive consideration to accepting as equivalent technical regulations of the other party.

STPV has tried to sell its stainless steel LPG cylinders in the USA through Australian distributors who manufacture stainless steel barbecues.

The USA refused to recognise the Australian Standard AS2470. STPV wrote to the DITR Minister, and after due consideration, DITR provided funds for Mr Miller and others to visit Washington to negotiate this issue directly with the Federal Department of Transport, a department of the government of the USA.

The Australian Government arranged meetings with D.O.T. and a telephone conference with The American Society of Mechanical Engineers. (ASME). A trade counsellor, from the Embassy of Australia was also appointed to provide support to the group. This official had been part of the team which negotiated the original agreement, and his guidance and support was greatly appreciated by the group.

The visit took place during the week commencing May the 20th.

Attached to this report are minutes for each of the meetings held in Washington. These have already been sent to DOT and ASME. The minutes list the representatives of D.O.T. and ASME who attended.

REPORT ON MEETINGS WITH D.O.T.

The first meeting was attended by eight people from D.O.T., which made for a difficult meeting at which it was sometimes difficult to hear what was being said.

D.O.T. made it clear that they saw their duty as protecting the American people from dangerous goods, a laudable aim, but one in which they were entirely unable to see any way but their own system, which has been in use for over 100 years.

They acknowledged the lack of an American standard which permitted the use of stainless steel as an acceptable material for LPG cylinders.

They advised that STPV would need to apply for a special permit and that this would require that D.O.T. engineers visit the STPV factory in Melbourne, that up to 9 cylinders would need to be supplied to them for testing in the USA, and that there would need to be regular inspection visits to STPV to check on procedures and conduct quality audits.

They were not prepared to accept that an internationally recognised inspection agency could perform this function on their behalf, or that the testing could be done by an independent laboratory in Melbourne.

We provided the D.O.T. people with a number of documents to support our case that appropriate arrangements could be put in place which would provide a suitable level of comfort regarding the quality of the product from STPV.

However they maintained their position that we would need to comply fully with their rules.

The Embassy of Australia official stated that this was not in the spirit of the FTA, but D.O.T. indicated, while they would look at any proposals we made, they felt we needed to comply with their rules, and stated that the rules were the same for local USA manufacturers.

This overlooks the costs required to be born by STPV for airfares and accommodation for D.O.T. people to visit STPV in Melbourne, and the costs of sending vessels to the USA for testing, and the time delays to achieve all this.

The practice in Australia of having all inspections and certifications of dangerous goods carried out by the private sector has been introduced over the last decade or so. It has been introduced by governments of both Liberal and Labor persuasion. However it gives no recognition to practices in other countries where the regulation of dangerous goods is seen as a government responsibility. The D.O.T. is a typical case in point. The difficulties this situation creates for a small section of industry such as STPV are not easy to overcome.

About a decade ago, AMSA assisted STPV to win a large export order for special chemical transportation vessels to Japan.

STPV is of the view that such government services should be available to assist companies in special situations such as we currently face. It is no good arguing that D.O.T. is behind the times – the fact is we need to address their concerns in a cost effective way.

STPV therefore proposes that government in Australia recognise this situation and agree to provide either a service which D.OT. may recognise as an acceptable compromise, or funds under one or other of the Industry programs which would help STPV to cover the costs of the D.O.T. program.

If the initial inspections and product approvals could be done under the auspices of government, while subsequent periodic inspections were carried out by approved private inspection agencies (that is by an agency registered with JAZ-ANZ) this may well be something that can be argued successfully with D.O.T.

D.O.T. explained that there were only one or two gas cylinder manufacturers left in the USA and that most “barbecue bottles” were imported from Thailand. This is similar to the situation in Australia where the only manufacturers of traditional bottles are APA Industries in Kilsyth Victoria and Manchester Tank in Echuca, Victoria. In fact D.O.T. was aware of Manchester, which is an American company which took over an Australian company many years ago. A large market share is supplied from Thailand.

We got the impression that D.O.T. was sceptical of the ability of the Thai companies to produce a quality product. Indeed they stressed their role in protecting the American public from poor quality product.

In response we stressed that STPV had a long history of supplying quality products to major customers including Tyco Corporation, United Technologies and Sandvik. We also mentioned our role in supplying special stainless steel cylinders to be used in de- arming bombs by the security services in this country. We also referred to our production of special cylinders used for fire protection by the RAAF when re – fuelling planes.

The difficulty for STPV is that the market for stainless steel LPG cylinders is small compared to cylinders made from carbon steel, the main target market being luxury boat owners. (Cylinders sell for prices between $A275 and $A410 retail (excl GST). Because production runs are small it is difficult to recover the costs incurred by the D.O.T. requirements. These are estimated as follows:-

2 representatives from D.O.T.

Air fares $8000 each
Accommodation 4 days @$250 per night $1000 each
Out –of-pockets $200 each

Costs to send 9 cylinders to the USA for testing $2000

TOTAL: $20400

CONCLUSIONS

There are a number of ways in which STPV can move forward with this project. These are outlined below:-

1. STPV to approach D.O.T. with a proposal for

(A) An internationally recognised Inspection Agency to Audit the factory

Alternatively

(B) This inspection is carried out either by The Victorian Workcover Authority or by The Australian Maritime Safety Authority.

© In the event D.O.T. insists on visiting STPV to conduct inspections prior to approval for export of the gas cylinders to the USA, STPV to apply for funding under an appropriate Industry program to cover the costs outlined above.

With regard to (B),

DITR to request AMSA to carry out an audit, and issue a certificate.

OR

DIIRD seek to arrange for Worksafe Victoria to carry out an audit, and issue a certificate.

In either case STPV to pay an agreed fee for this service.

(D) STPV to arrange for an internationally recognised Inspection Agency based in Melbourne and acceptable to D.O.T. to carry out periodic inspections at a frequency to be agreed.

(E) STPV to arrange for a Melbourne - based mechanical testing laboratory accredited by NATA to conduct such tests as are required by the code or by D.O.T. on a sample of production vessels from the STPV production line.

STPV requests DITR and the Washington Embassy to consider how best to approach the USA on the above proposals, and advise STPV on the best way to proceed.

STPV understands that officials from the Embassy of Australia and DITR, who were closely involved in making the arrangements, are both heavily committed to the APEC meetings about to take place in Sydney. It may therefore be towards the end of September before they are able to respond to this report.

Chris Miller
M.D. STPV
28-08-2007

COMPARISON DOT 4E, DOT 4BW AND ISO 18172-1 WITH AS2469, AS2470, AS3577, AS2971 AND AS3509

TITLE OF CODE	DOT-4BW	DOT-4E	ISO 18172-1	AS2971	AS2469	AS2470	AS3577	AS3509
DETAIL	**Welded steel cylinders with electric arc welded longitudinal seam.**	**Welded aluminium cylinders**	**Gas cylinders– Refillable welded stainless steel cylinders– Part 1: Test pressure 6 MPa and below**	**Serially produced pressure vessels**	**Steel cylinders for compressed gases – Welded two-piece construction – 0.1kg to 150kg**	**Steel cylinders for compressed gases – Welded three-piece construction with longitudinal joint - 11kg to 150kg**	**Steel cylinders for compressed gases-welded- 150kg to 500kg**	**LP Gas fuel vessels for automotive use**
TYPE	Arc welded, long seam butt welded. Cylinders closed by spinning not permitted. Welding by machine process.	Arc welded, long seams not permitted. Two seamless drawn shells	Arc welded. one longitudinal joint, not more than 2 circ seams	For small low hazard vessels where design, materials and construction are based on a series of performance tests on representative samples	Arc welded no longitudinal joint & one circumferential joint.	Arc welded. one longitudinal joint, not more than 2 circ seams	Arc welded. one longitudinal joint, not more than 2 circ seams	Arc welded full penetration butt welds. Maximum of two circ welds. All welds by machine process. Resistance welding not permitted
WATER CAPACITY	1000LBS MAX. (454 LITRES)	1000LBS MAX. (454 LITRES)	0.5 Litres to 500 Litres	500 Litres maximum	0.1 KG to 150 KG	11 KG TO 150 KG	150kg to 500kg	Max. 500 litres carbon steel. Max 200 litres stainless steel.
SERVICE PRESSURE	225 TO 500 PSI. (1552 TO 3100 kPA)	225 TO 500 PSI. 1552 TO 3100 kPA)	Test pressure 6 MPa and below	Greater than 0.05MPa. Upper limit of 3000PV & 1500 for harmful or very harmful contents.	1750 to 7000 KPa	1750 to 7000 KPa	1750 to 7000 KPa	2550 KPa
INSPECTION BY WHOM AND WHERE	(1) Independent inspection agency approved in writing by Director, OHMT. **OR** (2) .Where manufactured in USA, manufacturer's competent inspector. **AND** Chemical analyses and tests must be performed in USA, unless otherwise approved in writing by Director OHMT. **AND** Welding procedures and operators as per CGA C-3	AS FOR 4BW	(a) Radiographer certified at least level 2 of ISO 20807 (b) Visual inspection performed by a personnel who has extensive field experience and good judgement All inspection carried out at manufacturer's plant	(a) State Regulatory Authority OR (b) Integrated Pressure Equipment Test Station OR (c) In house AS/NZS ISO 9001 system. All inspection carried out at manufacturer's plant	Welding Supervisor qualified in accord with AS 1796. Gas cylinders acceptable to Inspecting Authority by reference to Design Approval number. All inspection carried out at manufacturer's plant	Radiographer certified by Australian Institute of Non-Destructive Testing. Welding Supervisor qualified in accord with AS 1796 or otherwise acceptable to Inspecting Authority. Gas cylinders acceptable to Inspecting Authority by reference to Design Approval number. All inspection carried out at manufacturer's plant.	Radiographer certified by Australian Institute of Non-Destructive Testing. Welding Supervisor qualified in accord with AS 1796 or otherwise acceptable to Inspecting Authority. Gas cylinders acceptable to Inspecting Authority by reference to Design Approval number. All inspection carried out at manufacturer's plant	Radiographer certified by Australian Institute of Non-Destructive Testing. Welding Supervisor qualified in accord with AS 1796 or otherwise acceptable to Inspecting Authority. Gas cylinders acceptable to Inspecting Authority by reference to Design Approval number. All inspection carried out at manufacturer's plant

TITLE OF CODE	DOT-4BW	DOT-4E	ISO 18172-1	AS2971	AS2469	AS2470	AS3577	AS3509
DETAIL	**Welded steel cylinders with electric arc welded longitudinal seam.**	**Welded aluminium cylinders**	**Gas cylinders– Refillable welded stainless steel cylinders– Part 1: Test pressure 6 MPa and below**	**Serially produced pressure vessels**	**Steel cylinders for compressed gases – Welded two-piece construction – 0.1kg to 150kg**	**Steel cylinders for compressed gases – Welded three-piece construction with longitudinal joint - 11kg to 150kg**	**Steel cylinders for compressed gases-welded- 150kg to 500kg**	**LP Gas fuel vessels for automotive use**
DUTIES OF INSPECTOR	Verify steel heat certificate by check analysis on 1 out of each batch of 200 cylinders. Verify markings, and condition of inside of cylinders. Carry out tests for threads, heat-treatment, volumetric cap., min wall thickness. Prepare complete test reports, which are to be retained for 15 years	AS FOR DOT-4BW	Not specified – refer to role of radiographic supervisor.	Not specified – refer to role of the welding supervisor.	Not specified – refer to role of the welding supervisor.	Production plant must have Integrated Gas Cylinder Test Station certified by a recognised Inspection Authority such as SAI-Global or International Standards Certification Pty Ltd	Production plant must have Integrated Gas Cylinder Test Station certified by a recognised Inspection Authority such as SAI-Global or International Standards Certification Pty Ltd	Production plant must have Integrated Gas Cylinder Test Station certified by a recognised Inspection Authority such as SAI-Global or International Standards Certification Pty Ltd
AUTHORISED STEEL/ ALUMINIUM	C, C-Mn weldable steel, max.UTS 35000psi. Higher S limit. 3grades very similar	Aluminium alloy 5154	Stainless steels suitable for press or drawing and welding and conform to ISO 9328-7 Grades of steel compatible with intended gas service in accordance with ISO 11114-1	Any material which meets the type tests	Continuously cast C-Mn steel and grades 304/L and 316/L stainless steel. Rimmed steel not permitted	Continuously cast C-Mn steel and grades 304/L and 316/L stainless steel. Rimmed steel not permitted	Continuously cast C-Mn steel and grades 304/L and 316/L stainless steel. Rimmed steel not permitted	Continuously cast C-Mn steel and grades 304/L and 316/L stainless steel. Rimmed steel not permitted
IDENTIFICATION OF MATERIAL	Any suitable method which will identify material to the manufacturer's lot number.	AS FOR DOT-4BW	Not specified	Not specified	Cast analysis shall comply with composition given in table 1 for carbon steel or composition as specified in ASTMA240 & A480 for grades 304 & 316	Cast analysis shall comply with composition given in table 1 for carbon steel or composition as specified in ASTMA240 & A480 for grades 304 & 316	Cast analysis shall comply with composition given in table 1 for carbon steel or composition as specified in ASTMA240 & A480 for grades 304 & 316	Cast analysis shall comply with composition given in table 1 for carbon steel or composition as specified in ASTMA240 & A480 for grades 304 & 316
DEFECTS	Material to be free of defects	Material to be free of defects	Annex B table B.1 specifies limits of defects	Material to be free of defects	Material to be free of defects	Clause 7 specifies limits of defects	Clause 7 specifies limits of defects	Clause 7 specifies limits of defects
MANUFACTURE	Generally smooth finish, no defects, uniform surface	Generally smooth finish, no defects, uniform surface	The surface of the metal, in particular that of the inner wall, shall	Each vessel must be able to pass the type tests.	Steel to be continuously cast & weldable quality.	Steel to be continuously cast & weldable quality.	Steel to be continuously cast & weldable quality.	Steel to be continuously cast & weldable quality.

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DETAIL	**Welded steel cylinders with electric arc welded longitudinal seam.**	**Welded aluminium cylinders**	**Gas cylinders– Refillable welded stainless steel cylinders– Part 1: Test pressure 6 MPa and below**	**Serially produced pressure vessels**	**Steel cylinders for compressed gases – Welded two-piece construction – 0.1kg to 150kg**	**Steel cylinders for compressed gases – Welded three-piece construction with longitudinal joint - 11kg to 150kg**	**Steel cylinders for compressed gases-welded- 150kg to 500kg**	**LP Gas fuel vessels for automotive use**
			be clean, dry and free from oxidation products, corrosion and scale					
WELDING			Must qualify all welding procedures to ISO 9956-1 and ISO 9956-3 and welders to ISO 14732 and ISO 9606-1	Not addressed	Must have qualified welding supervisor. Welders must be qualified	Must have qualified welding supervisor. Welders must be qualified	Must have qualified welding supervisor. Welders must be qualified	Must have qualified welding supervisor. Welders must be qualified
MINIMUM THICKNESS OF HEADS	90% of required thickness of side wall.	Not less than minimum required for side wall	Not more than required for side wall	Not addressed	90% of required thickness of side wall	90% of required thickness of side wall	90% of required thickness of side wall	90% of required thickness of side wall, subject to table 2.1
CIRCUM-FERENTIAL SEAMS	Joggle butt or lap joint	Not specified but must be gas shielded arc method.	Butt weld, full penetration	Not addressed	Joggle butt or square butt, both full penetration.	Joggle butt or square butt, both full penetration.	Joggle butt or square butt, both full penetration.	Joggle butt or square butt, both full penetration.
LONGITUDINAL SEAMS	Full penetration butt.	No long. seams	Butt weld, full penetration	Not addressed	Not Applicable	Full penetration butt	Full penetration butt	Full penetration butt
MISALIGNMENT OF LONG SEAM	1/6” of nominal sheet thickness or 1/32” whichever is less.	Not specified	Not specified	Not addressed	Not Applicable	Square butt: 15%. joggle butt: 25% of nominal sheet thickness (also applies to circ joint.)	Square butt: 15%. joggle butt: 25% of nominal sheet thickness (also applies to circ joint.)	Square butt: 15%. joggle butt: 25% of nominal sheet thickness (also applies to circ joint.)
RADIOGRAPHY	for JE=1, 100% rad. for JE= .9, 1 in 50 or 1 from start-up. **HOWEVER FOR JE = .75 no radiography is required**	Not required	100% length. One test at the beginning and one test at the end, per shift and per machine for both longitudinal and circumferential welds	Not required	Not required	Similar to DOT-4BW but no option for JE = 0.75	Similar to DOT-4BW but no option for JE = 0.75	Similar to DOT-4BW but no option for JE = 0.75
WELDING OF	Max Carbon content =	Must be weldable	The steel compatible	Not addressed	Same steel as for	Same steel as for	Same steel as for	Same steel as for

TITLE OF CODE	DOT-4BW	DOT-4E	ISO 18172-1	AS2971	AS2469	AS2470	AS3577	AS3509
DETAIL	**Welded steel cylinders with electric arc welded longitudinal seam.**	**Welded aluminium cylinders**	**Gas cylinders– Refillable welded stainless steel cylinders– Part 1: Test pressure 6 MPa and below**	**Serially produced pressure vessels**	**Steel cylinders for compressed gases – Welded two-piece construction – 0.1kg to 150kg**	**Steel cylinders for compressed gases – Welded three-piece construction with longitudinal joint - 11kg to 150kg**	**Steel cylinders for compressed gases-welded- 150kg to 500kg**	**LP Gas fuel vessels for automotive use**
ATTACHMENTS	0.25%	Aluminium	with that of the cylinder, e.g. selected to avoid corrosion couples.		cylinder	cylinder	cylinder	cylinder
OPENINGS IN CYLINDERS	Ends only	Ends only	Ends only except for certain LPG cylinders.	Not addressed	Ends only	Ends only	Ends only	Openings permitted in side wall.
WALL THICKNESS	> 6 inches O.D., minimum W.T. 0.078" (1.98mm). General case:- S = 2P(1.3D +0.4d) /E(D -d)	Minimum 0.14 inches (=3.55mm) as for DOT-4BW	Minimum wall thickness for shell "a" and end "b". For D≤100mm: a=b=1.1mm For 100<D≤150mm: A=b=1.1+0.008(D-100)mm For D>150mm: a=b=D/250+0.7, with an absolute minimum of 1.5mm a must ≥b	Not addressed	Carbon steel – 1.75mm Stainless steel 1.5mm	Carbon steel – 1.75mm Stainless steel 1.5mm	Carbon steel – 1.75mm Stainless steel 1.5mm	Carbon steel: 1.75mm or 2.2mm Stainless steel 1.5mm or 2.2mm
For service pressure of 2.55mPA, this gives the following for a cylinder 360mm dia	E=1 and min service pressure, WT= 2mm E=1 and max service pressure, WT=4.4mm E=0.9 and min. service pressure, WT=2.2mm. E=0.9 and max service pressure, WT=4.85mm. E=0.75 and min.service pressure, WT=2.65mm E=0.75 and max service pressure, WT=5.85mm	At min service pressure 3.5mm At max service pressure 7.65mm						

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Minimum design stress	?	?	0.2% proof stress or for austenitic steels in the solution annealed condition, 1% proof stress	Not specified	Carbon steel: Maximum of 320Mpa (90% of Y.S. or max 60% of minimum T.S.) Stainless steel: Maximum of 360Mpa (90% of Y.S.or max 53% of minimum T.S.)	Carbon steel: Maximum of 320Mpa (90% of Y.S. or max 60% of minimum T.S.) Stainless steel: Maximum of 360Mpa (90% of Y.S.or max 53% of minimum T.S.)	Carbon steel: Maximum of 320Mpa (90% of Y.S. or max 60% of minimum T.S.) Stainless steel: Maximum of 360Mpa (90% of Y.S.or max 53% of minimum T.S.)	Carbon steel: Maximum of 66% of Y.S. of parent metal or 42.6% of T.S. of parent metal. Stainless Steel: Maximum of 66% of Y.S. of parent metal or 40% of T.S. of parent metal.

DETAIL	DOT-4BW	DOT-4E	ISO 18172-1	AS2971	AS2469	AS2470	AS3577	AS3509
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PRODUCTION / TYPE TESTS :-								
1. HYDROSTATIC	By water jacket or other suitable method	As for DOT -4BW	By liquid or gas 100% pressure test	100% to minimum proof pressure shown in table 1.1	100% to test pressure specified in AS2030.1 (for LPG=3.3Mpa)	100% to test pressure specified in AS2030.1 (for LPG=3.3Mpa)	100% to test pressure specified in AS2030.1 (for LPG=3.3Mpa)	Proof test 100% @ 3.3mPA
	1 out of 200 expansion	As for DOT -4BW						
	1 in 500 @ 4 x service pressure	1 in 1000 @ 4 x service pressure	100% leak test		100% leak test @ 0.5mPA	100% leak test @ 0.5mPA	100% leak test @ 0.5mPA	Leak test 100% @2.3mPA
	All others 2 x service pressure	As for DOT -4BW						
2. STRETCH TEST	Volumetric exp., max 10% of elastic expansion	Max 12% of elastic expansion.	Not specified	Not specified	Stretch test (0.02% of original volume) on one prototype	Stretch test (0.02% of original volume) on one prototype	Stretch test (0.02% of original volume) on one prototype	Stretch test (0.02% of original volume) on one prototype
3. FLATTENING TEST	Not specified	1 in 200	Not specified	Not specified	Not specified	Not specified	Not specified	Test on inserted pads
4. PULSATION TEST	Not required	Not required	Required on 3 prototypes	Required on 3 prototypes	Required on 3 prototypes	Required on 3 prototypes	Required on 3 prototypes	Required on 3 prototypes
5. STRENGTH TEST OF VALVE PROTECTION.			Not specified–refer to drop test described in ISO 11117	Not specified	1 test on prototype	1 test on prototype	Not specified	1 test on prototype
6. HOOP STRESS TEST	Not required	Not required	Not required	3 tests on prototypes	1 test on prototype	1 test on prototype	1 test on prototype	1 test on prototype
7. HEAT TREATMENT	Any suitable heat treatment in excess of 1100 C	Not required	For cylinders subjected to cold forming or cryoforming processes do not require heat	Not specified	Stress relief or normalising of carbon steel cylinders. Cylinders made of	Stress relief or normalising of carbon steel cylinders. Cylinders made of	Stress relief or normalising of carbon steel cylinders. Cylinders made of	Stress relief or normalising of carbon steel cylinders. Cylinders made of

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			treatment		stainless steel do not require heat treatment.	stainless steel do not require heat treatment.	stainless steel do not require heat treatment.	stainless steel do not require heat treatment.
8. PARENT METAL TENSILE TESTING	1 in 200 bodies 1 in 200 heads	1 in 200 circ welds	1 in 0-200 1 in 201-500 2 in 501-1500 3 in 1501-3000 cylinders	Not specified	Up to 50 litres water capacity: 1 in 500 cylinders. Over 50 litres water capacity: 1 in 250 cylinders.	1 in 250 cylinders.	1 in 250 cylinders.	1 in 200 cylinders.
9. WELD METAL TENSILE TESTING	1 in 200 long. seams none for circ welds	1 in 200 circ welds	1 in 0-200 1 in 201-500 2 in 501-1500 3 in 1501-3000 cylinders	Not specified	Up to 50 litres water capacity: 1 in 500 cylinders. Over 50 litres water capacity: 1 in 250 cylinders.	1 in 250 cylinders.	1 in 250 cylinders.	1 in 200 cylinders.

Appendix 4 - PRODUCTIVITY COMMISSION SUBMISSION JULY 2008

From: [details withheld]
Sent: Tuesday, 22 January 2008 7:20 AM
To: Chris Miller
Subject: Re: Design approval for LPG bottles made in Australia and for use in NZ
Hi Chris
In short the cylinder approval system in NZ has remained relatively unchanged despite the incoming of the HSNO Act and legislation.What prevailed under the old Dangerous Goods Act is still pretty much the case now.
1.The Lab # system is still the bottom line allowing cylinders to be distibuted, sold, filled and tested in NZ .
2 Australian specifications for LPG cylinders e.g.2469,2470.and indeed the whole framework of specs.particular to LPG cylinders have now in the main become joint standards which demonstrates how compatible our systems are.
3.Nevertheless we return to the cornerstone of NZ cylinder safety system and that is the Lab Approval system.
4.Firstly you have to apply for design verification and the issue of a Lab #.e.g [details withheld] is a design verifier.This
process also includes assessing the manufacturers QA/QC.
5.Having obtained the design approval and the Lab#, you then move onto Regulation22 PreCommisioning acceptance.On arrival you are not allowed to distribute until a test certifier approved for the task inspects the shipment for compliance selects samples and supervises any destructive tests required.Then only when a test certificate is issued clearing the shipment may the cylinders be sold and distributed.
6.The next shipment requires physical tests and visual inspection,before clearance.(Regulation 19 Commisioning.)
7.Every shipment from this point on requires Regulation 19 (Visual Only) clearance unless there is a reason to suspect standards have dropped.
There you go Chris, anymore questions feel free to ask.
Best Regards
[details withheld]

----- Original Message -----
From: Chris Miller
To: [details withheld]
Sent: Monday, January 21, 2008 5:16 PM
Subject: Design approval for LPG bottles made in Australia and for use in NZ

I have been talking to [details withheld] about this matter and he has suggested
you can help us.

now Xmas is over and done with, I am keen to find out what we need to do to have our LPG bottles registered in New Zealand. We have been making these bottles for over ten years. We have full design approvals from Australia for the different states. Can you let me know what else I have to do?

What happens in the case of bottles with a test date prior to the introduction of the new regulations? Do they still have to be stamped? We have customers who purchased bottles some years ago who say they cannot get the bottle filled in NZ.

hoping to hear from you soon,

best regards,

Chris Miller
General Manager
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Ferntree Gully Vic 3156

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