



Safety Lines



OCCUPATIONAL SAFETY
& HEALTH SERVICE
TE RATONGA ORANGA



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TE TARI MAHI

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No. 53, March 2002

Defective Gauge Glass Cock

Information and pictures supplied by Mike Donnellan.



General view of a gauge glass cock.



Close-up view of a gauge glass cock showing water dripping through the fillet where the flange is attached.

A boiler owner decided to upgrade his gauge glass cocks and obtained a new set from the supplier. However, just prior to installation, the fitter noticed a potential problem with the water-side cock and investigated further.

After filling it full of water, he noticed an apparent porosity problem with the bronze casting. The casting did indeed appear to be porous and the problem may have been exacerbated by the bore of the flange

having been threaded to a greater depth than necessary, causing excessive thinning of the metal. The close-up picture shows a drip of water emerging through the fillet where the flange is attached – and that's under no pressure whatsoever!

The local supplier provided a replacement and returned the defective unit to the factory for further advice.

Forklifts Used as Cranes

Some forklifts may be fitted with an attachment that allows them to manoeuvre loads in a similar manner to a mobile crane.

The Health and Safety in Employment (Pressure Equipment, Cranes, and Passenger Ropeways) Regulations 1999 defines 'Crane' as follows:

"Crane" -

- (a) Means a powered device -
 - (i) That is equipped with mechanical means for raising or lowering loads suspended by means of a hook or other load-handling device; and
 - (ii) That can, by the movement of the whole device or of its boom, jib, trolley or other such part, re-position or move suspended loads both vertically and horizontally; and
- (b) Includes all parts of the crane down to and including the hook or load-handling device, and all chains, rails, ropes, wires, or other devices used to move the hook or load-handling device; but
- (c) Does not include lifting gear that is not an integral part of the crane.

From the above definition, it follows that once such a lifting attachment is fitted to a forklift, the combined unit becomes a crane and is subject to the requirements of the PECPR Regulations. This means

that for such crane work the machine needs to have a Certificate of Inspection issued by a recognised inspection body.

Forklifts are generally de-rated in this operating mode, due to the impact of the dynamic load and altered stability configuration. The crane attachment as supplied should have all the information required from the attachment manufacturer/agent to cover the lifting capacity and stability matters. The forklift manufacturer's instructions should also be closely heeded.

Pressure Vessel Heads

We have been made aware that there is some possible confusion about the need for fabrication inspection of pressure vessel heads during manufacture.

Pressure vessel heads are subject to conformity assessment in their own right, the same as the complete vessel of which they are to form a part. The requirements for conformity assessment are given in the *Approved Code of Practice for Pressure Equipment (Excluding Boilers)*, Appendix A.

This means that, at the time and place of manufacture, these items are to be subject to fabrication inspection in accordance with Appendix A corresponding to the hazard level of the finished vessel.

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Pressure Problems

by Mike Donnellan

The safety features of a five-year-old 1,800 kg/hr unattended boiler were being tested following survey and the safety valve was first verified as operating satisfactorily at 1,034 kPa as indicated on the main boiler pressure gauge.

With the boiler still firing and still at maximum operating pressure, it was blown down in order to check correct functioning of the low water level probes. These cut out the flame, rang the appropriate alarms, etc., on reaching the two levels provided for. However, when all the resulting steam had disappeared - the blow down pit is open to atmosphere - both the main boiler pressure gauge and the pressure controller were seen to be registering pressures in excess of 1,200 kPa! The boiler serviceman couldn't offer any explanation for this phenomena but did say he thought the safety valve spring was probably too "weak". Apparently the

safety valve adjustment needed to be tightened down further than was usual.

The main boiler pressure gauge and pressure control equipment were screwed into a small manifold, which in turn was supplied by a nozzle on top of the boiler. It was found that this nozzle was substantially blocked giving both a false reading on the main boiler pressure gauge and false indication to the boiler control equipment.

The boiler safety valve had been set against the false gauge reading, hence its having been wound down a full three turns greater than normal - so it hadn't been "weak" after all! The reason for the blockage proved to be something of a mystery because the waterside of the boiler was exceptionally clean and free of scale and corrosion.

This episode highlights the value of having control lines and passages cleaned and checked at survey time. Some might also see justification for having available a secondary means of indicating boiler pressure - from an alternative outlet on the boiler shell.

Pressure Testing of Equipment and Setting of Safety Valves

In response to an industry enquiry, Engineering Safety is producing guidelines for pressure testing of equipment and setting of safety valves. The guidelines will take the form of an Engineering Safety Notice. This article is a forerunner of that notice, the final form of which could be influenced by reader feedback.

These guidelines apply in relation to pressure equipment within the meaning of the PECPR Regulations. Whilst every care has been taken over advice given here, the user is fully responsible for ensuring that applicable standards are met.

It is acceptable to verify safety valve pressures in one of the following circumstances:

- For a pressure vessel (other than a boiler), on a test bed or in situ (clean service), provided that the gauge used has been calibrated and has a current certificate of calibration.
- During a boiler inspection under steam, against the boiler gauge, provided that the gauge has been calibrated and has a current certificate of calibration.

- During a boiler inspection under steam, against a gauge, which has been calibrated and has a current certificate of calibration, fitted to the test point situated at the boiler pressure gauge.

During accumulation testing to verify safety valve capacity, the pressure must not exceed 110% of the maximum allowable working pressure, unless permitted by an appropriate standard for a multiple valve installation. Valves are to be set to a pressure not exceeding 100% of maximum allowable working pressure, but an appropriate standard may permit setting at up to 105% of the maximum allowable working pressure for one or more valves in a multiple valve installation or for an additional pressure relief device.

Any gauge used for the pressure testing of equipment and setting of safety valves must have all of the following features:

- Be of the Bourdon tube type;
- Have a recommended nominal size of not less than 150 mm, and be large enough for the scale to be read, from the normal reading position, to the accuracy required to ensure that the valve settings are accurate;

- Have a scale extending over an arc of approximately 270 degrees;
- Have a scale selected such that the working pressure lies in its middle third.

Such a gauge should also be chosen so as not to indicate in excess of 75% of full scale range at working pressure (assuming a steady pressure).

A gauge used for verifying safety valve pressures must be traceably calibrated to confirm that its error

does not exceed 1% of maximum scale value for indications between 10% and 90% of maximum scale value, and otherwise 1.5%. Calibration must be carried out by an accredited laboratory. The gauge is to be calibrated against a reference gauge, which in turn has been calibrated against a more accurate gauge, and so on back to the national standard. For traceability, all links back to the national standard must be fully documented.

ICPVT-10

This is a follow-up on a previous article, which appeared in *Safety Lines* No. 49.

The Tenth International Conference on Pressure Vessel Technology ICPVT-10 will be held from July 7-10, 2003, in Vienna, Austria.

ICPVT-10 is being organised by the Austrian Steering Committee of the European/African Regional Committee. It is supported by international experience and technical guidance from the American Regional Committee, the Asian and Oceanic Regional Committee, and the European/African Regional Committee.

ICPVT-10 provides an international forum to update knowledge of pressure vessel technology, including boiler technology. The main purpose of ICPVT-10 is to bring together engineers, scientists, and others interested in:

- Design, manufacture, testing and operation;
- Codes and Standards; and
- The exchange of experience and technical information,

regarding pressure vessel technology including boilers, vessels, piping, pipelines and gas cylinders.

Language: The official conference language will be English.

Venue: Vienna University of Technology, which is within easy walking distance of the city centre. In addition to the scientific programme an exhibition and social programme will be organised.

Topics: Papers are requested for the following topics:

1 Design and Analysis

- 101 General
- 102 Special applications and environmental considerations

- 103 Creep – Relaxation-Fatigue-Seismic excitation
- 104 Corrosion – Corrosion-protection – Erosion
- 105 Special components (heat exchangers, pumps, compressors, fittings, flanges, sealings)
- 106 Advanced analysis – Fracture mechanics techniques – Risk assessment
- 107 Seismic design of structures – Structures under extreme loading conditions

2 Materials and Manufacturing

- 201 Metallurgical developments
- 202 Assessments of materials in aggressive environments
- 203 Advances in welding and bolting of components
- 204 Factory and on-site manufacturing techniques

3 Experimental Studies – Operating Experience and Failure Analysis

- 301 Residual life prediction – Lifetime extension – Availability
- 302 Small and large scale experimental techniques
- 303 Scale-up approaches
- 304 Preventative maintenance and repair schedules
- 305 Feedback from failure analysis

4 Codes and Standards – Quality Assurance – Non-destructive Testing and Inspection

- 401 Quality assurance from design to start-up
- 402 Non-destructive examination techniques
- 403 Inspection strategies – Surveillance and operational monitoring
- 404 Repair procedures and assessment of integrity
- 405 Conformity assessment and certification
- 406 Regulations, Codes and Standards

Synopsis Submission: Synopses of about 200 words, indicating the relevant topic from the above list, and highlighting new findings to be discussed in the paper, should be submitted by mail, fax or email. Required accompanying information includes complete address of (leading) author, phone and fax numbers, and email address (if available). Synopses should be sent to the Regional Committee Chairman by 1 May 2002. New Zealand synopses should be sent to the Asian-Oceanic Regional Committee Chairman. The address is as follows:

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5th Floor, Sanpo-Sakuma Building
1-11 Kanda-Sakuma-cho
Chiyoda-ku
Tokyo 101-0025
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Ph: +81 3 3255 3486
Fx: +81 3 3255 3488
Email: hpi2518@mx1.alpha-web.ne.jp

Submission Key Dates:

Synopsis submission	1 May 2002
Advice of status to authors	1 July 2002
Submission of draft paper	1 November 2002
Final paper submission	1 March 2003

Further information: For further information, please contact the Local Secretariat at the following address or visit the website.

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Conference Website: <http://info.tuwien.ac.at/IAA/>

Engineering Safety and *Safety Lines* Readership Survey Results 2001

This article is reproduced (with minor changes) from a letter sent in January to known clients.

This year we received 183 replies to our annual client survey (a 20.5% return rate), which is slightly less than last year. Engineering Safety's performance was evaluated by 121 of those respondents and *Safety Lines* by 179. Many thanks to all those who took the time to reply to us.

The 2001 response was compared to the previous year's and is presented in the charts on page 6. It appears that although the perception of Engineering Safety's performance generally fits the established pattern of previous years, some indicators are slightly down. *Safety Lines* appears to have weathered the transition to electronic format without loss of usefulness or popularity, as seen from the corresponding chart.

A number of things have happened to Engineering Safety (apart from business as usual) and these may have impacted to some extent on our performance. Throughout the year we have been searching for ways to extend our service, particularly by assisting the regional OSH offices but also in other ways, and clarify our role within the Operations Policy Unit where we reside. This has been time-consuming but is likely to be worth it in the end. The scope of Engineering Safety activities has also increased with the inclusion of forklift training and amusement devices. Other extensions are quite likely, so it will probably be more business than usual!

To offset the additional workload (without additional staff!) we have also been looking at our internal systems. This is a large work in progress but is solidly under way. The net effect of this upfront activity should be smoother and even more timely performance.

Some negative comments have been made about the electronic-only format of *Safety Lines*, but also several people have expressed appreciation of its flexibility. We hope that those who have yet to do so will take advantage of this medium and we intend to develop it over time.

As in previous years, we refer readers who expressed an interest in a broader range of occupational safety and health issues to publications such as *Safeguard* and *Safeguard Update* (Colour Workshop Ltd, Ph: 09 418 2502).

Index Update

The *Safety Lines* index has been updated and now covers issues 1 to 52. The index is available for download in Word and pdf formats. It can be reached from our Web page www.osh.dol.govt.nz via the following path:

Health and safety publications

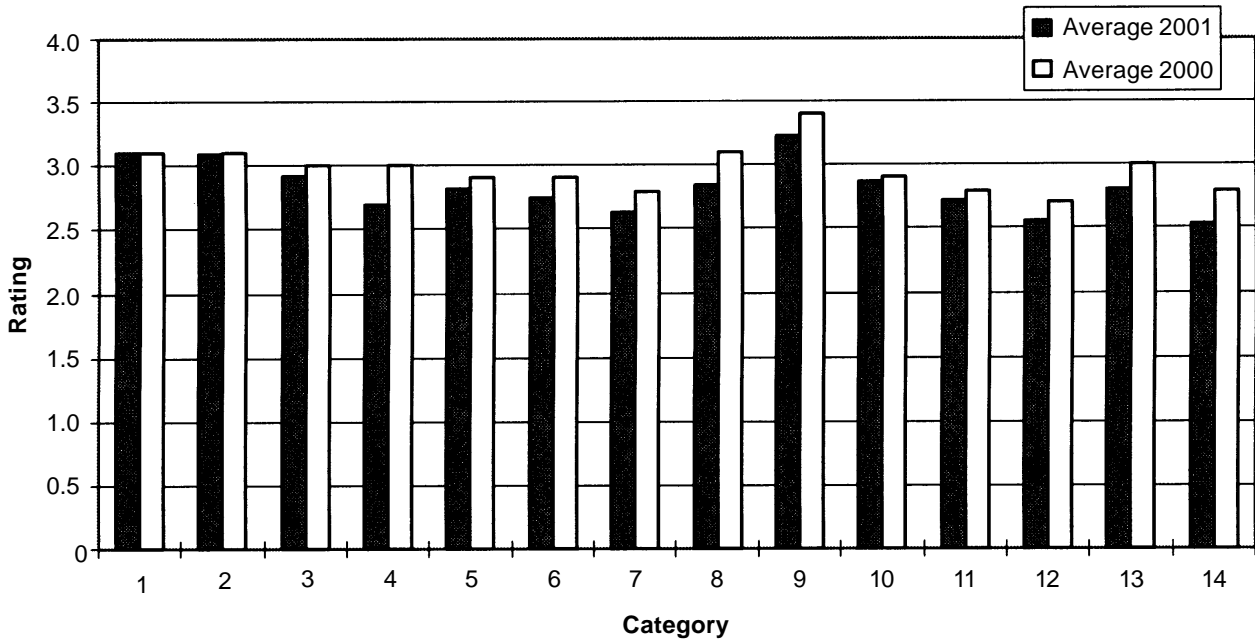
OSH publications

Series/Bulletins etc.

Safety Lines (series)

The index is at the bottom of the *Safety Lines* (series) list.

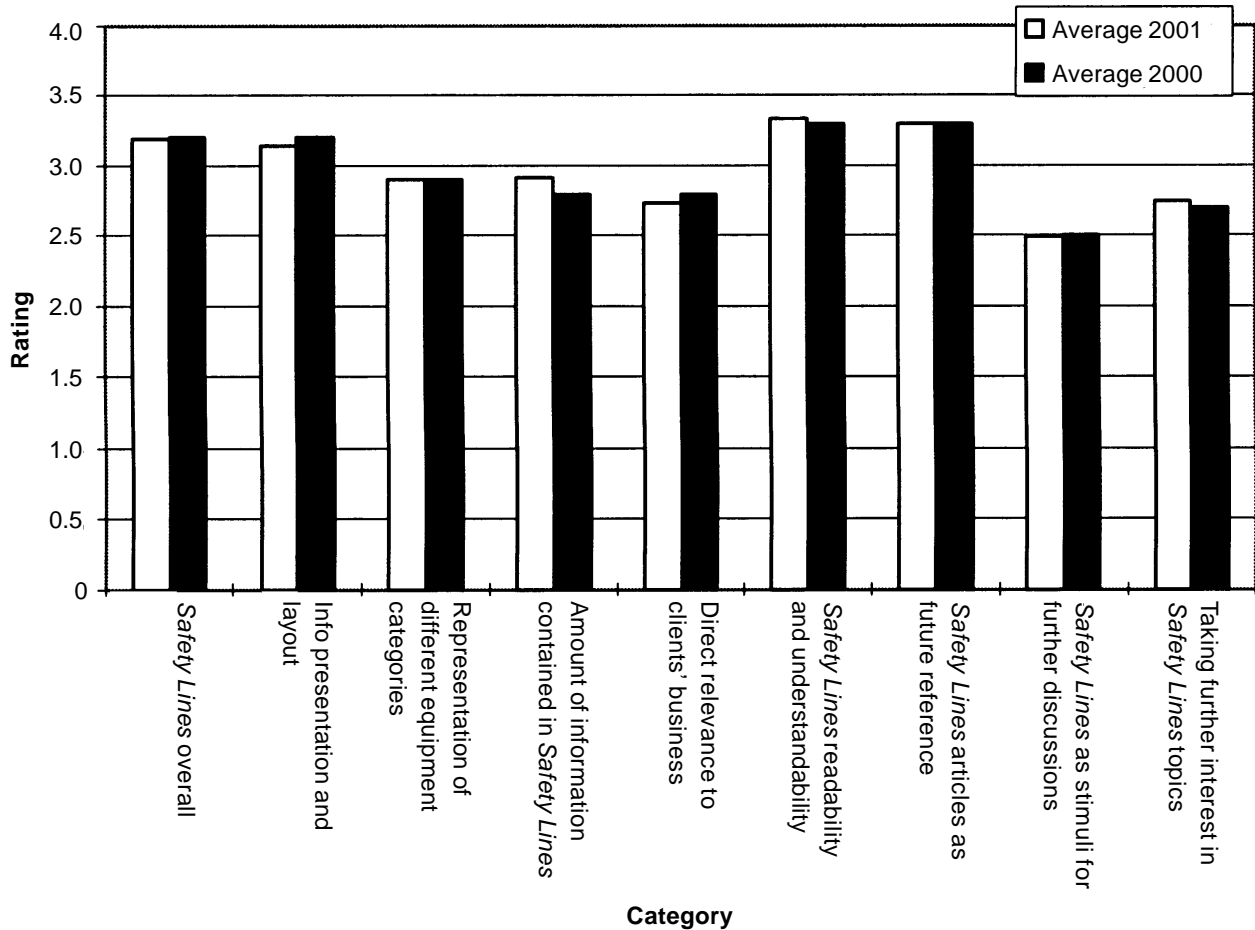
Engineering Safety Service



Key to categories in above chart:

- | | |
|------------------------------|--|
| 1 Met needs? | 8 Inform on engineering safety issues affecting your business? |
| 2 Quality - reliability? | 9 Contact us easily? |
| 3 Quality - responsiveness? | 10 Resolve your enquiries? |
| 4 Quality - accountability? | 11 Help improve safety standards? |
| 5 Quality - empathy? | 12 Make your concerns our priority |
| 6 Understand your viewpoint? | 13 Timely response to your enquiries? |
| 7 Help find solutions? | 14 Flexible in meeting your needs? |

Safety Lines Readership



HERA Courses and Seminars

The following courses and seminars are being offered by the New Zealand Welding Centre:

Seminar: Reliability Based Maintenance, How German Companies are Facing Global Competition, Quality Requirements for Welding Operations.

Venues: Palmerston North April 15/16
Wellington April 18/19
Rotorua April 23/24
Christchurch May 6/7
Dunedin May 9/10
Invercargill May 14/15
Auckland May 20/21

Seminar: MIG/MAG and Flux Cored Arc Welding.

Venue: Manukau City May 28

Course: Welding Inspection.

Venue: Manukau City March 11-15
June 17-21
September 2-6
November 11-15

Course: Surface Methods Inspection.

Venue: Manukau City March 25-28
August 5-8

Course: Welding Engineering
(the course is in three blocks).

Venue: Manukau City
Block 1 - Welding Metallurgy April 8-12
Block 2 - Welding Technology July 22-26
Block 3 - Design, Fabrication
and QA November 4-8

For further details contact:

**New Zealand Welding Centre
HERA House
PO Box 76-134
17-19 Gladding Place
Manukau City
Auckland
Phone: 09 262 2885 Fax: 09 262 2856
Email: admin@hera.org.nz**

Announcements

The following organisation has been recognised under the PECPR Regulations as an Inspection Body for the fabrication inspection of pressure vessels:

**Boiler and Pressure Vessel Safety Program
Ministry of Community, Aboriginal and
Women's Services
400-88-6th Street
New Westminster BC V3L 5B3
British Columbia
Canada
Contact: Malcolm Bishop, Manager of
Field Operations**

The following organisation has been granted exemption under regulation 5 of the PECPR Regulations, and may carry out fabrication inspection on its own pressure equipment of hazard levels D and E (as defined in AS 4343-1999):

**John Thompson Package Boilers
A Division of Rolls-Royce Australia Ltd
PO Box 133
Carole Park
Qld 4300
Australia**

The following organisations have been granted exemption under regulation 5 of the PECPR Regulations, and may carry out fabrication inspection on their own pressure equipment of the given hazard levels:

Pressure equipment type	Hazard level (as defined in AS 4343-1999)
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Pipework	B, C, D and E
----------	---------------

Pressure vessels/Boilers	D and E
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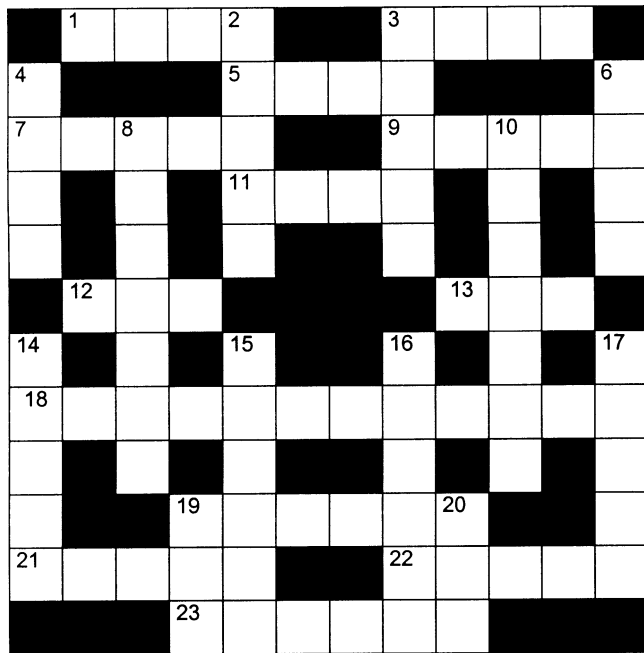
**Robt Stone & Co Ltd
P O Box 232
New Plymouth
Fitzroy Engineering Group Ltd
Private Bag 2053
New Plymouth 4620**

Email Reminder

If you would like to be reminded when *Safety Lines* is posted on the Internet, please send your email address to sl-list@osh.dol.govt.nz. An acknowledgement is not normally issued unless there is some specific point to answer, so if you have previously requested the reminders you may assume you are on the list.

As a navigation aid, the reminder includes a link directly to the current issue.

Puzzle Place



Answers include abbreviations and acronyms.

ACROSS

- 1 Deliver a cricket ball
- 3 Progress Evaluation and Review Technique
- 5 Otherwise
- 7 Make fun of
- 9 Shouts
- 11 Qualification issuing agency
- 12 Examination without damage
- 13 Correspondence enclosure for the reply
- 18 Between the stars
- 19 Source of danger
- 21 Attire
- 22 Maintain by reasoning
- 23 Weirdly

DOWN

- 2 Bloodsucking parasite
- 3 Regulations
- 4 Article
- 6 American engineering society
- 8 pH can give a measure of this
- 10 Pleasant
- 14 Sacked
- 15 Lubricant
- 16 Of the central nervous system
- 17 Lifting machine
- 19 An Act
- 20 Not wet

Answers can be obtained by email from robin.bain@osh.dol.govt.nz.

Answers to *Safety Lines* Issue 52 Crossword

ACROSS

- 1 Gain
- 3 Unit
- 5 To
- 6 Chat
- 9 ID
- 11 As
- 13 SI
- 14 cc
- 15 er
- 16 Radii
- 19 Budge
- 21 MA
- 22 Or
- 23 In
- 24 Sc
- 25 Hertz
- 26 Shrub
- 28 Is.
- 30 Mr
- 31 OK
- 32 St.
- 33 KO
- 35 Snip
- 37 n.m.
- 38 Data
- 39 Rife

DOWN

- 1 Go
- 2 NC
- 3 UT
- 4 Ti
- 5 Torr
- 7 HSE
- 8 Air
- 10 Dune
- 12 Scimitar
- 14 Churches
- 17 ASME
- 18 IANZ
- 19 Boss
- 20 Guru
- 25 Hook
- 27 Boom
- 28 Ion
- 29 Ski
- 34 O.D.
- 35 SA
- 36 Pr.
- 37 NE

Safety Lines is a publication of the Engineering Safety Unit of the Occupational Safety and Health Service, Department of Labour, PO Box 3705, Wellington.

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