Safety Lines

OCCUPATIONAL SAFETY & HEALTH SERVICE

DEPARTMENT OF LABOUR
TE TARI MAHI

ISSN 1171-9354

ENGINEERING SAFETY NEWSLETTER, OCCUPATIONAL SAFETY AND HEALTH SERVICE

No. 44,
December 1999

Controllers and Bailees

A Controller

A "Controller" is defined in the Health and Safety in Employment (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999 as meaning "a person who is the owner, lessee, sublessee, or bailee of equipment in a place of work (not being a home occupied by a person)."

It is possible that more than one person can be the controller of the same equipment at the same time. Each of these persons will have duties under the PECPR Regulations but what each will need to do, in order to comply with their duties, is likely to be different.

The PECPR Regulations apply in addition to the Health and Safety in Employment Act 1992 (See regulation 7). This means that a person may simultaneously have duties under both the Act and the Regulations. Hence, reference should be made to the Act in order to understand the regulations fully.

The Interpretation section of the Act includes in (subsection 2(2) a statement to the effect that:

(a) A person may, at the same time, be an employer, a self-employed person, a person who controls a place of work[1], a principal, a contractor, and a subcontractor;

(b) If a person has more than one of the above roles, they must comply with all the duties imposed on them by these roles;

(c) The same duty may, at the same time, be imposed on two or more different persons, whether they have the same roles or, if they have different roles;

(d) A person's duties are not diminished or affected by the fact that another person may have the same duties, in the same or a different role.

---

[1]The term "person who controls a place of work" is defined in the Act as meaning:

(a) the owner, lessee, sublessee, occupier, or person in possession, of a place of work (or any part of it); or

(b) the owner, lessee, sublessee, or bailee of any plant in a place of work.

Only (b) of this definition is relevant to the PECPR Regulations.

"Plant" is defined as including such things as appliances, equipment, fittings, furniture, implements, machines, tools and vehicles; and anything that is connected to plant, including controls.

In other words, a "controller" (as defined in the PECPR regulations) is a particular kind of person who controls a particular kind of plant (equipment) in a place of work.

TOGETHER to ZERO eliminating workplace deaths

The effect of subsection 2(2) of the Act is that if there is more than one person who is the owner, lessee, sublessee, or bailee of an item of equipment, then each of those persons has to simultaneously comply with all of the duties imposed by the PECPR Regulations. For example, an item of equipment may be owned by one person and leased by another, in which case each person has duties imposed by the PECPR Regulations and the Act in relation to that equipment.

Of course, this does not mean that, where there is more than one person with the same duty, they must do exactly the same things. The steps that are practicable for one person to take will not necessarily be practicable for another person. The Act does not contemplate that kind of equality. Whenever there is a step which it would be practicable for a person to take in their particular circumstances, that step is required to be taken irrespective of what steps might be required of other persons.

For most duties in the regulations, it will be the person who has day-to-day control of the equipment who will be in the best position to carry them out. Others persons should seek written confirmation that the duties are, in fact, being carried out. (This might be included in the terms and conditions of contracts.)

In practice, what is required is consultation and co-operation among all persons on how best to ensure that the overall objective–***safety***–is achieved.

The “person” with duties will usually be an organisation

In law, a “person” includes organisations such as companies and incorporated societies, as well as individuals. The duties in the Act and regulations are imposed on the “person”.

Most equipment will be owned or leased by an organisation and, consequently it is the organisation that has to comply with the Act and regulations.

Of course, day-to-day, it will usually be an employee (such as a manager) who actually carries out the work of ensuring that the law is complied with. However, the duty (and accountability for any failure to comply) remains with the organisation although the employee has duties under section 19 of the Act to ensure their own safety and to ensure that they don’t cause harm to any other person.

A Bailee

A bailee, for the purposes of the PECPR Regulations and the Act, is a person who knowingly comes into possession of equipment (the bailee) which belongs to another person who is the owner (the bailor). Ownership of the equipment remains with the bailor but the bailee has possession. (There must be a transfer of possession and usually, control of access to the equipment must pass from the bailor to the bailee.) For example, a contractor hiring a crane from the owner and using it to carry out work on a building site; the contractor is the bailee of the crane while the owner is the bailor, and a bailment has been created.

A bailee and bailor are not necessarily confined to a relationship where equipment is hired out. This relationship could exist in other situations where possession and control of access to equipment passes from an owner to user. A loan of equipment between acquaintances could create a bailment.

This article was prepared by Rex Moir, a Business Adviser with OSH. If you have any queries on this subject he can be contacted at:

Phone (04) 915 4459
Fax (04) 915 4370
Email rex.moir@osh.dol.govt.nz

AS 1210 Supplement 2-1999

Engineering Safety advises readers that Supplement 2 for AS 1210 has been released. This specifies requirements for vessels, designed and constructed from austenitic stainless steel, that are cold stretched following fabrication. Cold stretching enhances proof strength and generally permits higher design strengths than those specified in AS 1210 Supplement 1. (See *Safety Lines* No 39, September 1998 for *Background to Cold Stretching Process*.)

This supplement supersedes SAA Rule PE/1–Enquiry 101/95. This earlier ruling was not recognised by OSH and vessels manufactured in accordance with it are generally not used in New Zealand.

Supplement 2 makes significant advances on the former ruling and, as a consequence, Engineering Safety will recognise this supplement for use in New Zealand.

Code of Practice for Pressure Equipment

A draft *Code of Practice for the Design, Operation, Maintenance and Servicing of Pressure Equipment* has been prepared and is now available for public comment. A copy of the draft can be obtained from Engineering Safety or downloaded as a word document or pdf file from the OSH website at:

http://www.osh.dol.govt.nz/order/catalogue/draft.shtml

The industry group, which prepared this draft, included representatives from manufacturers, inspection bodies, operators, HERA and OSH. The main features of this code of practice are:

1. It covers all pressure equipment coming within the scope of the Health and Safety in Employment (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999 except for boilers. Boilers are covered by an existing approved code of practice.
2. It incorporates the existing Engineering Safety Document guidelines (ES Docs) for pressure equipment, except for those dealing with boilers.
3. It continues the provision, promulgated in ES Docs, for manufacturers to work within certified quality management systems. The existing ES Docs refer to AS 3920.1 but this reference has been replaced in Appendix A of the draft with data having substantially the same effect as this standard.
4. It has adopted AS/NZS 3788: 1996 *Pressure equipment - In-service inspection* as the basis for in-service inspection of pressure equipment.
5. It generally makes reference to existing standards and does not repeat technical detail available from these standards.

Engineering Safety invites comments from all sectors of the pressure equipment industry. To assist us with collating your input, it is requested that general and technical comments be presented in the following form:

1. General comments should be presented first. These should be precise and if appropriate examples provided.
2. Specific comments should each be divided into three columns as follows:

a) Reference - clause, table and page numbers, etc.

b) Action- change, delete, add, move, etc.

A comment is best presented as a proposed change to the text.

c) Reason - justify the action item proposed.

We also invite your comment on editorial changes, e.g. grammar, spelling, etc.

Replies should be sent to:

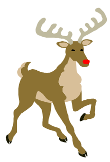
Peter Williamson
Business Development and Operations Unit
Occupational Safety and Health Service
Department of Labour
PO Box 3705, Wellington
Email: peter.williamson@osh.dol.govt.nz
Phone: (04) 915 4461 Fax: (04) 915 4370

We expect initial processing and a report to be completed within the first quarter of 2000. This will be published on the OSH website.

Our programme, for analysis of submissions, reporting and recommending the approval of a code of practice to the minister and publication of a code of practice, is for this work to be completed within the second quarter of 2000.

Thou shalt not overload equipment!

(PECPR Reg. 10)



Electrical Protection—A Crane Consultant's Viewpoint

One of the least addressed features of cranes has been the electrical protection systems of their drives. These systems are vital to the safe performance of cranes and should be designed by experienced crane engineers.

The development of the electric motor resulted in a major step forward in the powering of cranes. Initially, a single motor would be applied to a crane drive together with a series of clutches and pawls to connect other drives. As the cost of production fell, motors were applied to all drives and multi-motor cranes became the norm.

Early crane motors were DC series wound and were relatively simple to provide with speed control and electrical protection. DC motors also had an inherent advantage of favourable speed/torque and speed control characteristics. Light loads could be moved fast and heavy loads moved slowly, all with good control and protection.

The DC motor, because of the relatively simple and effective protection systems available, could be easily applied to cranes. They had, until the introduction of modern variable frequency AC drives, a major advantage over AC motors.

The introduction of the AC motor with its relatively low cost has, for many applications, been a more attractive proposition than the DC motor. AC motors became competitive with DC motors for most crane applications but with their use on cranes, came a consequential need for electrical protection and safety systems.

Hoisting systems using AC motor drives should have at least the following protection and safety features:

- A current sensitive phase failure and under voltage relay.
- Triple pole circuit breakers.
- Reversing contactors fitted with thermal overload relays.
- A main contactor.
- An emergency stop button on the controller.
- A main switch in series with the power supply to the system, mounted in an accessible position for use in an emergency.

The trend to variable frequency and other types of AC variable speed drives for cranes must be carefully considered. At present, due to cost, variable speed drives are only fitted to more expensive and higher duty cycle cranes but, the time is not far away when they will be fitted to standard hoist units. These drives, regardless of the cranes to which they are fitted, must be designed in accordance with the 'fail-safe' principles established for existing cranes and have the electrical systems noted above.

Another crane control development requiring considerable care in design, is the use of radio controllers on cranes and especially their use on tower cranes.

Any radio-controlled system must be designed to de-energise the main contactor when a loss of radio signal occurs. (It is likely that the main contactor and not the reversing contactors would be set up to react to a loss of signal.) Thus a loss of signal should mean that the complete power system is shut off and all brakes safely applied. A well-designed radio control system should have duplicate transmission of all instructions to the receiver, together with monitoring of signal check sums, to give assurance that control signals have been correctly received. Any discrepancy between these signals, or other failure of the transmission system, should immediately drop out the main contactor.

Under the Pressure Equipment, Cranes and Passenger Ropeways Regulations, crane controllers must take all practicable steps to ensure that their cranes are safe. Among other duties, they must establish compliance with the requirements of the regulations relating to design, design verification, manufacture, installation and inspection.

Crane design and manufacture is a serious business and inspection bodies responsible for crane design verification and inspection should have access to experienced crane engineers conversant with crane electrical systems.

This article is an extract from a more comprehensive paper written by J J McArdle, a consultant and certified crane design verifier. The complete paper is available from Engineering Safety. Ed.

Preparing for Annual Lift Inspections

(by Sam Geise, P.E. – Accordia Resort Services – Reproduced with permission of the Ski Area Management)

Just as it makes good sense for your car to have an annual inspection to assess wear and tear, and make sure brakes work properly, it is essential for ski lifts to get thorough annual inspections. These inspections are an important part of having a safe, reliable lift during the winter season, saving both time and money in the long run.

Annual lift inspections are also an ANSI B77.1 requirement*. Section X.3.4.1 from the new 1999 ANSI is listed below.

X.3.4.1 General inspection

"Each aerial lift shall be inspected annually, or after each 2000 hours of operation, whichever comes first, by an aerial lift specialist independent of the owner. The inspection shall verify preservation of original design integrity and cover the requirements of this standard for maintenance, operation, required self-inspections and record keeping. Items found either deficient or in non-compliance shall be noted. A report signed by the specialist shall be filed with the owner."

Here are some tips to help your inspections go as smoothly as possible. The following should be available to the inspector:

- Log books: Daily Operational, Wire Rope and Maintenance.
- Manufacturer's manuals (Operational and Maintenance).
- Lift Data Sheet.
- Lift Evacuation Plan.
- Person(s) familiar with the above plans, logs and manuals.
- Operator and attendant to operate the lift.

The following is a typical list of lift inspection items and what is to be done:

- A visual inspection of each terminal and the entire length of the lift by walking or riding the lift.
- Assurance that the tension carriage, counterweights or other tensioning devices are functional and have adequate travel with clearance at both ends of travel.
- Operation of manual and automatic switches in terminals, stations, and loading and unloading areas. This includes safety gates; bull-wheel guide sheave derail switches; emergency brake and service brake switches; counterweight/ tension devices or tension carriage limit switches, and other automatic switches that are located in terminals, stations and loading and unloading areas.
- Operation of all braking systems. Observe for proper functioning of the service brake, emergency brake, high-speed backstop and bull-wheel rollback brake.
- Operation of communication systems.
- Operation of the lift, including a round-trip ride.
- Operation of the auxiliary motor either alone or connected to the lift.
- Inspection of loading/unloading areas.
- Inspection of carriers.
- Verification of required signs.

**Aerial ropeways in New Zealand are regulated by HSE (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999, supported by the OSH "Approved Code of Practice for Passenger Ropeways in New Zealand 1998". This approved code refers to National Standards of Canada document CAN/CSA-Z98-96: "Passenger Ropeways".*

While the ANSI B77.1 is not a standard recognised under the PECPR Regulations, Safety Lines has reproduced this article because it outlines a sound practice for many aspects of aerial ropeways systems. It should be useful and informative for readers.

Readers should note that a significant difference between the practice noted in this article and the "Approved Code of Practice for Passenger Ropeways in New Zealand 1998" is that the code specifies annual inspection of aerial lifts, regardless of the accumulated operational hours. Also, other items require inspection under this code and these include: wire ropes/splices inspection; inspection of bolted load bearing carriers' connections, and testing of "grip force" indicator, where fitted. Engineering Safety encourages aerial lifts' controllers to obtain further guidance on annual inspection requirements from their inspection bodies. Ed.

Protection and Inspection of Safety Valves

The photograph and information included in this article were supplied by Allan Fraser, manager of the Dunedin office of M&I Safety Inspection Services Ltd. Ed.

The photograph (right) shows part of the stem and valve disc of an IMO tank container safety valve. It has been included in *Safety Lines* to illustrate the importance of weather protection and regular inspection and testing of safety valves.

The valve is a Mega Thermic relief valve fitted to a multi purpose twenty-foot tank container used for transporting ammonia, propane, butane, cyclopropane, methylene and isobutane. Its set pressure is 22 bar gauge. The tank was manufactured in 1992 and it had in-service inspections in 1995 and 1998 followed by a more recent inspection that included 100% MPI. During this last inspection the valve was stripped and inspected.

The photograph shows extensive corrosion residue from the valve body and cover. Also, it shows in front of the stem, two lumps of welding slag that were found loose inside the valve. This slag appears to have been dislodged from one of the three guides on the periphery of the valve disc. One of the guides had a fillet weld clear of slag and free of corrosion while the other two had slag-covered welds and were in a similar state as the rest of the valve.

The corrosion that was developing in the valve, and the slag, could have compromised vessel protection by inhibiting the ability of the valve to operate at set pressure or, to close to a tight shutoff.

The same surveyor who provided the above photograph also has a safety valve taken from a similar LPG vessel in which the spring had broken and the valve disc had frozen by corrosion to the valve seat. This vessel had been in service immediately prior to the inspection that picked up this very dangerous condition.

The message, which Engineering Safety wishes to get across to readers responsible for such vessels, is as follows:

- **Fittings on transportable vessels and, in particular, safety and relief valves and other protective devices, must have adequate weather protection.**
- **Safety and relief valves must be regularly serviced, inspected and tested.**

Replacement of BS 5500 Specification for Unfired Pressure Vessels

Engineering Safety advises readers that a draft of a new European standard EN 13445 *Unfired Pressure Vessels* has been issued for public comment. This standard will be published in 2002 and at this time British Standards Institution (BSI) will be obliged to withdraw BS 5500.

Because this proposed standard lacks the comprehensive engineering coverage of BS 5500 and because of the consequential industry demand, BSI plan to publish BS 5500 under the new reference PD 5500:2000.

The new PD 5500 will have similar content, validity and application as the current BS 5500.

BS 5500 has been adopted in New Zealand as a pressure vessel standard reference NZS/BS 5500 and in line with the moves by BSI, Standards New Zealand is about to start the formal process of replacing NZS/BS 5500 with PD 5500.

PD 5500 will be applicable from January 2000 and copies of this document will be available from Standards New Zealand.

Pressure Discharge Bulk Transport Vessel Explodes Under Pressure

The Incident

Employees at a Bayswater foundry were lucky to escape serious injury when a contractor's pressurised bulk transport vessel exploded.

The contractor had delivered 23 tonnes of casting sand to the foundry and was transferring the sand from the transport vessel to the foundry's sand hopper.

To do this the transport vessel was pressurised to approximately 200 kPa (30 psi). This operation had been in progress for about 6 minutes when the vessel exploded spraying sand for a distance of 20 metres from the vessel.

Contributing Factors

1. The pressure vessel had been repaired by a method that was not in accordance with recognised pressure vessel standards.
2. The shell plate had corroded to the extent that it was no longer capable of withstanding the vessel's operating pressure.
3. Other alterations and repairs had been carried out that were not of an acceptable standard.

Recommendations

Pressure vessels must be inspected regularly by a person competent in pressure vessel inspections in order to detect any defects that may affect the integrity of the vessel.

All repairs or alterations must be carried out to recognised pressure vessel standards.

Welding repairs or alterations must only be carried out by qualified welders using qualified weld procedures.

This article was taken from a 'Significant Incident Summary' published by WorkSafe Western Australia. Such vessels in New Zealand will normally come within the scope of the PECPR Regulations. They must be periodically inspected and certified by an inspection body. Ed.

Inspection Body Support Services

Now that the PECPR Regulations are in place, inspection bodies must be ISO 17020 (EN 450040) accredited for inspection work on equipment coming within the scope of these regulations.

Inspectors make professional judgements about the safety of equipment and in instances where visual examination is insufficient they may engage the services of specialist subcontractors. In cases where the results of these specialist services affect the decision of the inspector, it is a requirement of accreditation that the subcontract work be of accreditable quality. An endorsed report from an organisation accredited for the work concerned provides that assurance.

Where it is impractical to employ an accredited contractor the inspection body must perform their own rigorous assessment of the subcontractor's competence against the requirements of ISO Guide 25 or ISO 17020. Such assessments must be carried out by competent persons and be fully documented.

It is common practice for inspection bodies to ask equipment controllers to organise NDT or other specialist services. As the results of this subcontracted work become, in effect, part of the endorsed report or certificate, the inspection body must not delegate responsibility for the quality of this work. In other words, if an inspection body is to use the results of a specialist subcontractor engaged by their client, it is the inspection bodies responsibility to ensure that the subcontractor has appropriate accreditation and that the reports provided are endorsed.

Inspection results must be based on firm foundations to fulfil the requirements of the PECPR Regulations and accreditation. Full accountability in inspection underpins the safety of New Zealand's pressure equipment, cranes and passenger ropeways.

Engineering Safety Staff Contact Details

Contact details for Engineering Safety staff are as follows:

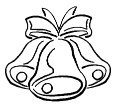
Bryn George
Ph: (04) 915 4433
Fax: (04) 915 4370
Email: bryn.george@osh.dol.govt.nz

Peter Williamson
Ph: (04) 915 4461
Fax: (04) 915 4370
Email: peter.williamson@osh.dol.govt.nz

Geoff Edwards
Ph: (04) 915 4435
Fax: (04) 915 4370
Email: geoff.edwards@osh.dol.govt.nz

Mato Dugalic
Ph: (04) 915 4460
Fax: (04) 915 4370
Email: mato.dugalic@osh.dol.govt.nz

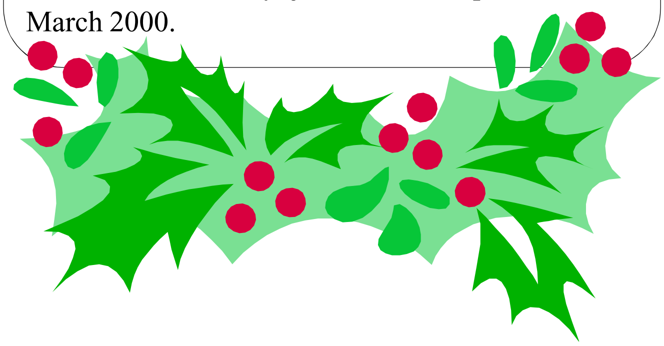
Merry Christmas!



We wish all our readers a merry Christmas and a happy New Year.

The Engineering Safety office will be closed between the 25th December and 4th January inclusive.

The next issue of *Safety Lines* will be published late March 2000.



Safety Lines Newsletter

Safety Lines is published to assist understanding of The Health and Safety in Employment Act 1992, The Health and Safety in Employment Regulations 1995 and The Health and Safety in Employment (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999.

Readers are reminded that only the courts can issue binding interpretations of this legislation and that where necessary they should consult their legal adviser.

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

Editor: Peter Williamson

Phone: (04) 915 4461
Fax: (04) 915-4370
Email: peter.williamson@osh.dol.govt.nz

Contents