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Crane Luffing Rope Inspection

(Submitted by: Mike Jack of SGS M&I)

Crane luffing rope

A routine inspection earlier this year of a crawler crane prior to re-entering service on a large industrial building site resulted in the luffing rope having to be replaced before any further use.

The crane was fitted with a 45-metre boom with 9-metre heel, 3 x 9-metre inserts, and 9-metre head and rigged with a 30-tonne main hook and a 10-tonne fly hook. The maximum rated load was 100 tonnes.

The manufacturer's rope specification was a 20 mm diameter T7 x 7 + 6 x Fi 29 IWRC Reg lay, with a breaking strength of 34.1 tonnes.

It is believed that this was the original rope fitted to the crane when it was imported into New Zealand.

A close inspection of the luffing rope found broken wires, probably fatigue related. The location of the breaks was identical on each of the twelve parts of the luffing rope.

The crane had been inspected the previous year and had been issued a certificate of inspection. The inspection had not detected any issues regarding the condition of the luffing rope.

From discussions with the crane operator it appears that subsequent to that inspection, the crane had been used on the same site for 10 months to erect similar major equipment, a job that required the crane to work at repeated cycles of radius and boom height. It does not appear that the crane had been in service since leaving the previous site.

It was therefore evident that:

1. The crane had been erected with the luffing rope in the above condition prior to this inspection. It would appear the rope was not inspected on disassembly on the previous job or upon re-erection by the erectors at this site.
2. There had been no evidence of crane driver or owner self-inspection or awareness that fatigue problems could occur with ropes of this age and repetitive usage.

There are a number of lessons from this incident:

1. Crane inspectors must take cognisance of the history of operation of these types of cranes when carrying out routine inspections. Talk to the crane operator and find out where and how the crane has been operated since the previous inspection.
2. Talk to the crane operator and assess whether he and the controller implement self-inspection, review maintenance.
3. Ensure good rope inspection carried is out using penknife blade and rope tongs ('parrot's beak').

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Boilers, Lifts and Cranes (BLC) Act 1950

The BLC Act 1950 is due to be finally repealed on 16th January 2006 when the Transport Amendment Act takes effect. When the HSE Act was promulgated in 1992, much of the BLC Act was repealed. For those of you with a dusty copy of this Act on their shelves these sections were:

- 1950, No 53—The Boilers, Lifts, and Cranes Act 1950: Sections 3, 4, 10 to 35, 54, 56, 59, and 60. (RS Vol 1, p 377.)
- 1966, No 100—The Boilers, Lifts, and Cranes Amendment Act 1966: Sections 3, and 4 to 9. (RS Vol 1, p 406.)
- 1971, No 84—The Boilers, Lifts, and Cranes Amendment Act 1971. (RS Vol 1, p 409.)

However, enough sections were left effective to take care of the safety of traction engines.

New Traction Engine Regulations, effective under the Land Transport Amendment Act 2005, will remove any further need for the BLC Act. These regulations, due shortly after the repeal of the BLC Act, will set licence requirements for traction engine drivers and require traction engines to have certificates of inspection issued by inspection bodies that are accredited and recognised under the PECPR Regulations. They will also require operators of traction engines to be qualified and the machines themselves to be maintained in good condition.

Engineering Safety recommends that traction engines be inspected as set out in AS/NZS 3788: *Pressure equipment – in-service inspection*. The latest draft of the revision of this Standard is out for final comment at the moment.

A side effect of this final repeal of the BLC Act will be that owners and operators of unattended and limited attendance boilers will no longer need to have an exemption from s37(3) to operate their boiler without a qualified operator in attendance. They will still need to inform this office when the boiler is installed or converted to unattended or limited attendance operation and they will still need to have a quality management system for its operation.

Traction Engine Regulations

The green light has been given to the development of traction engine regulations. This follows approval having been given on the 29th November 2005 by the Hon. Harry Duynhoven, Minister for Transport Safety, for the Ministry for Transport to issue drafting instructions to the Parliamentary Counsel Office.

The new regulations will require traction engine operators to hold suitable qualifications, and to require traction engines to be driven or operated in a public place to undergo a boiler and pressure equipment inspection every two years, by an accredited inspection body.

It is likely that the new regulations will:

- Require that one operator on any traction engine must hold a current class 2 driver's licence or overseas equivalent. Anyone driving a traction engine must hold a qualification relevant to driving and manoeuvring a steam driven vehicle, and an operator firing or operating a stationary traction engine must have a qualification relevant to the preparation and operation of a steam driven vehicle.
- Recognise an appropriate qualification issued under the New Zealand Qualifications Authority framework as an appropriate certificate of competence for the operation of a traction engine.
- Require inspections of the boiler and pressure equipment to be undertaken by an accredited person, with a copy of the inspection certificate being provided to the Director of Land Transport.
- Empower appropriately qualified people to inspect traction engine boilers and issue inspection certificates.
- Create an offence for operating a traction engine on a road or public place without holding the appropriate certificate of competence or without the engine having a current boiler inspection certificate, and establish a maximum fine for that offence.
- Enact other necessary provisions.

The new regulations, which will replace the current provisions of the Boilers, Lifts and Cranes Act 1950 on that Act's repeal, will in turn eventually be replaced by a rule made under the Land Transport Amendment Act 2005.

Design Verification in Relation to Hazard Level

Recently we were asked what was the difference in level of design verification for hazard levels A and B and those for C and D, as note 4 to table A in the *Approved Code Of Practice For Pressure Equipment (Excluding Boilers)* indicates that the design verifier needs to be similarly qualified in both cases.

The design verifier required qualification for both the case of A-B and C-D hazard level equipment is the same. The process of design verification is effectively the same in each case.

However, the verifier's operations are constrained within the employing organisation's infrastructure, a factor that contributes greatly to the overall level of assurance. In the case of an inspection body recognised under the PECPR Regulations, which will be accredited to AS/NZS ISO/IEC 17020: 2000 *General criteria for the operation of various types of bodies performing inspection*, its infrastructure is, during the accreditation process, specifically judged against the performance expectations of a professional inspection body. This is not the case for an organisation operating under an exemption from the PECPR Regulations, which will be certified to AS/NZS ISO 9001: 2000 *Quality management systems - requirements*.

Thus, the level of assurance provided in the A-B hazard level case is appropriately greater than that in the C-D hazard level case.

From the point of view of design verifier qualifications, there is currently no advantage to a recognised inspection body in operating under an exemption from the PECPR Regulations.

Equipment upgrades – required tests

It has come to our attention that in some instances equipment inspectors are having difficulty in gaining the cooperation of equipment suppliers, and occasionally controllers, in carrying out testing of new equipment.

Equipment suppliers and controllers should note that when a new hoist is fitted to an existing crane it is necessary to have a load test carried out. Similarly, steaming tests are required when a new burner is fitted to an existing boiler. These tests are to comply with PECPR Regulation 11(c).

Crane Anti-Collision Devices

Where two or more cranes are working on the same long travel, or cross travel, there must be a means provided for avoiding or mitigating a collision between them. There are a number of crane installations with this type of arrangement and Engineering Safety wishes to focus controllers' attention on the need for such safety equipment.

AS 1418.1-2002 *Cranes, hoists and winches Part 1: General requirements* states, in **8.8.7 Design and construction**, that 'Anti-collision devices shall be used where they are essential to the safe operation of the equipment in order to prevent damage from collision between two cranes … '.

The new version of the *Approved Code of Practice for Cranes* will appropriately incorporate this requirement.

HERA Courses and Seminars

HERA Training Centre is offering the following courses and seminars for the first part of 2006:

Activity	**Dates**
Welding Inspection	6th – 10th March
Surface Methods of Inspection	3rd – 7th April
EWP Inspection	20th April
Ultrasonic Wall Thickness	31st May- 1st June

The venue for the above courses and seminars is:

HERA House
17 - 19 Gladding Place
MANUKAU CITY (South Auckland)

Note: Enrolment closes 7 days before start of course.

For further details contact:

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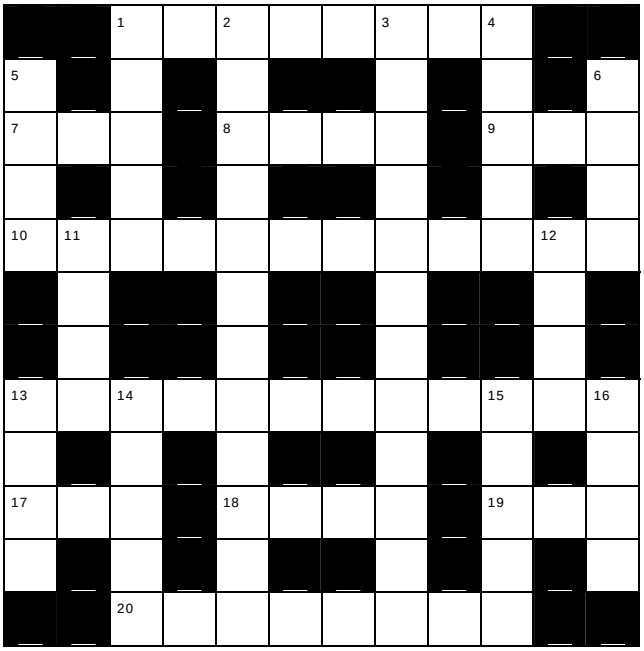
PUZZLE PLACE

(Issue 68)



Answers include abbreviations and acronyms.

ACROSS

1 Towards the front

7 Pressure unit

8 Happy

9 Join numbers together

10 Applied science practitioner

13 Policy of keeping one's distance

17 Examination without damage

18 Expressing change of state; interested in (colloq.)

19 Long time period

20 Public talkers

DOWN

1 Old unit of currency (foreign)

2 In the nature of generating again

3 Radioactive substance used in NDT

4 Hindu religious teacher

5 Brief satirical piece

6 Prepare for publication

11 Consumes

12 Cuts with a toothed blade

13 Accreditation body – e.g. to ISO 17020

14 Cooking places

15 Thoughts

16 Non-vegetarian food

Answers can be obtained by email from:

robin.bain@dol.govt.nz.

Answers to *Safety Lines* Issue 67 Crossword

Across

1 Obfuscate

8 Lop

9 CFC

10 Madame

12 Kea

13 Can

14 Vow

15 Vent

16 God

17 Talc

20 Sea

21 Ate

22 Rim

23 Bushel

25 Lot

26 Inventory

Down

2 Backwoodsmen

3 Unmanageable

4 CAD

5 Electrically

6 IPENZ

7 Scavengers

11 Ale

15 Volt

18 Ash

19 Heats

24 Sot

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