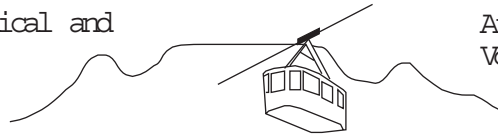


WCB ENGINEERING BULLETIN

The Institution of Certificated Mechanical and
Electrical Engineers
Western Cape Branch (WCB)
P.O. Box 504, Rondebosch 7700

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MISSION STATEMENT : 1. To uphold the image and status of the Certificated Engineer. 2. To represent the Certificated Engineer at ECSA and other decision-making bodies concerning legislation, safety & health standards, the environment and the machinery regulations. 3. To promote continued education and training of its members and future engineers. 4. Promote fellowship in the engineering profession.

Editorial

Your branch committee is most encouraged by the well attended talks and visits. It is the function of the Institution to serve its members by providing access to information and the experiences of other engineers. If you can offer a visit or a talk, or would like some avenue of interest to be explored by the committee you have only to contact the editor or branch chairman and hey presto! it will done.

Members are no doubt pleased to receive the newsletter "The Certificate" which keeps us abreast of ICMEE affairs and ECSA matters. Dave Sheldon is to be thanked for persevering in this monthly production. May it stay with us and perhaps blossom into a broadsheet and who knows a petit journal.

The Occupational Health & Safety Act goes far beyond the guarding of machinery and the testing of vessels under pressure. The occupational health emphasis is in the field of the industrial hygienist and not the engineer. In a large enterprise it may be necessary for the company to employ such a hygienist who will recommend the steps that the company needs to take to comply with the Act. Some safety practitioners and occupational health nurses are qualified to some extent in this direction or experienced enough to handle this aspect. To expect the competent person to maintain machinery safe and workers free of industrial diseases is a bit much. Management must provide the direction and the means for both these aspects of occupational risk.

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Local Branch News

Since our last Bulletin we have had our second general meeting for the year. We had an interesting talk on the Labour Relations Act by Brian Mackrell of TST Training. The event was attended by 28 members and friends.

We also had a visit to the Ice Plant at Old Mutual's head office in Pinelands. This event was attended by 23 members and guest. By the time you read this we would have visited John Thompson (Africa) on the 22nd July.

The next event that any Plant Engineer, Maintenance Manager, maintenance planner and Engineering Manager should not miss is our seminar on "Modern Maintenance Management Concepts". The seminar will be held at the Edgemoed Test and Demo Centre on the 16th September. We have an interesting array of speakers lined up to give a fresh approach to cost effective maintenance & the information systems to manage it.

On receipt of your enrolment form you can duplicate it and circulate to your colleagues and people in your company that you know can benefit from the seminar. We only have 60 seats available, ensure yours by early enrolment. It promises to be an exciting event.

The Klerksdorp branch of ICMEE let it slip that they intend challenging us for the next Argus Cycling Tour. All you cyclists out there get your cycling shorts on and start practising, we will keep you posted. □

HEIN MULLER
Branch Chairperson

SPECIALIST DATABASE

We are in the infant stage of establishing a database of members offering consulting and professional services, as well as of other (non-members) reputable professionals in Engineering.

The objective is to be able to provide members with a comprehensive list of reputable service providers in Engineering, be it safety, legal, design, general or specific electrical, mechanical and civil, etc.

The requirement for such a service to members has never been quantified, nor has the number of members offering specialist consulting service. In order for us to quantify and to determine whether such a requirement exists, please photocopy and complete the appropriate questionnaire below and forward to: The Hon. Secretary, P.O.Box 504, Rondebosch 7701. Full details will be requested once it has been established that such a requirement in fact does exist among members.

See questionnaire at bottom of Page 3

EXTRUDER ACCIDENT

A 21 year old man worked for 3 months operating a yeast extruder which is in fact a powerful mincing machine. He worked with two experienced employees. At the end of each day the last bits of yeast were pushed into the worm using a stick and the machine was cleaned with a bristle brush with a 20 cm handle and water whilst the machine ran. A loose hopper about 23 cm deep was usually removed during the cleaning process. The opening above the worm screw was 30 cm by 15 cm. The machine had been operated and cleaned at the end of each working day in this manner for about 7 years without an incident.

The operator had learnt his work from the experienced employees. From the evidence it is adduced that he used his right hand instead of the stick or brush to push the little bits of yeast into the worm after the hopper had been removed. He avers that someone called him and he was distracted. His right arm was drawn into the worm and severed above the elbow before he could shout to the assistant standing near the switch. The impression gained at the enquiry was that the injured person's memory of events was confused. He insisted that the assistant who switched off was not at the machine at the time of the accident although the latter insisted that he was. He also insisted that he used the bristle brush in spite of the fact that it could be inferred from the evidence of the storekeeper that the brush was never lost, because he had not issued one subsequently. (The severed arm was run through the worm into a bag and buried and the brush would have been buried with the arm if it had been used).

Three weeks before the incident an inspector on a routine visit required deeper hoppers to be fitted to the two extruders. These were in the process of being made, and one had been fitted to the other machine but the accident occurred before both hoppers were fitted.

Had the injured person used the brush or stick provided by the management he would not have lost his arm. By using his hand he was taking chances and the instant his attention was distracted by someone calling he was caught. He therefore caused his own accident.

COMMENT

General Machinery Regulation (GMR) 4(1) requires the user to ensure that the operator is aware of the dangers of the machine and the precautions to be taken to obviate the dangers.

In this case a push stick and brush had been provided but the evidence is not clear as to whether they had been used. It would appear not to have been used otherwise it was unlikely that the accident would have occurred. The provision of a deeper hopper was a sound recommendation, but one machine was allowed to be used pending its completion. The practice of removing the hopper for cleaning negated the value of this safety device.

GMR 6(1)(a) requires start-stop devices to be within reach of the operator. In this case the switch was under the control of a second person some distance away, a very unsatisfactory situation in this case.

GMR 5(1) requires the user to ensure that persons working on moving machinery to be a competent person or trained "to the satisfaction of an inspector". Three months of operating and cleaning this simple machine should have been sufficient experience for the injured person. It is accepted that the

machine must run to be cleared of the product, but the safety requirements must be strictly adhered to. These are:

- (a) use of a push stick
- (b) a deep hopper to ensure safe distance from the worm
- (c) restricted apertures at mouth of hopper
- (d) control switch within easy reach of operator.

General Machinery Regulation (GMR) 6(1) requires the user to report an incident within 7 days on prescribed forms, and in this case where a limb has been lost it must be reported forthwith by telephone or similar means to the provincial director. This accident had not been reported as required and was discovered when an inspector visited the premises 6 weeks later.

Note: The user immediately after the accident fitted the deeper hopper to that extruder. The firm continued to employ the one-armed man on full pay in a suitable capacity. □

RARE INCIDENT REVEALS SHORTCOMINGS

Most incidents are the result of a number of situations occurring simultaneously as shown by the following incident: A 15 tonne per hour, twin flue, coal-fired boiler registered a low water condition. The spare feed water pump failed to rectify this condition. Fast action by the operator prevented a "melt down", by following the shutdown procedure. Situation one: the feed check valve allowed a back flow from the boiler into the feed line because its teflon seat was damaged. This happened while the feed pump was not running. Situation two: the impeller of the water meter fitted in the feed line is made of plastic. The hot water flowing back from the boiler deformed the impeller to such an extent that it blocked the feed line.

Situation three: no by-pass is provided around the water meter. Questions arising from this incident are the suitability of non-metallic substances in high temperature situations and the absence of a by-pass in a feed line which supplies two of such boilers.

A modulating Mobrey water level control, standard on all John Thompson twin flue coal-fired boilers, would have prevented this incident as the feed pump runs continuously thus preventing a back flow from the boiler.

A. Wyntje

OCCUPATIONAL HEALTH & SAFETY ACT 85 OF 1993

Issue No 7

Section 33: Joint inquiries

In the event of a reportable incident resulting in a death, a joint Inquest-Inquiry may be held. The magistrate and the inspector will make separate reports.

Section 35: Appeal against decision of inspector

An appeal must first be made to the Chief Inspector within 60 days and if not satisfied a further appeal may be made to the industrial court also within 60 days. If the inspector issued a Prohibition Notice to prohibit an action or process from continuing the notice remains in force pending the final decision.

Continued on Page 3 col. 2

COMPETENT PERSONS - MUST THEY CARRY THE CAN?

There seems to be a concept abroad that the Competent Person (who may be a Certificated Engineer) carries the full responsibility for complying with the provisions of the Occupational Health & Safety Act of 1993, as amended. Let us consider if this is indeed so.

In terms of the Factories, Machinery and Building Work Act of 1941, as amended, the Responsible Person, as he was then called, had certain legal duties, including:

- (i) To comply with the regulations
- (ii) To maintain machinery in a safe condition
- (iii) To maintain safety devices in a sound condition
- (iv) To stop the working of a dangerous machine.

The infringement of these duties constituted a criminal offence for which he could be charged in a Magistrate's court.

This provision in the regulations fell away under the MosAct of 1983 and was not re-introduced in the OH&S Act of 1993. Legal duties are not now specified for the Competent Person who has been appointed to supervise machinery. General Machinery Regulation 2(1) requires an employer or user of machinery to designate a person with certain technical qualifications in writing to do What? Only the title of the regulation suggests "supervision of machinery". The remaining regulations under this set of regulations places legal duties on the employer or user but not on the competent person. In general, the user has to comply with the machinery regulations and the employer must comply with the health regulations. There is also no provision in the health regulations for the competent person to ensure compliance with these regulations.

The latest safety act places the legal accountability squarely on the shoulders of the employer and user. It is they who must provide engineering and technical staff to run their businesses safely. When expert advice is needed they must engage such persons - not the competent person. The Certificated Engineer certainly had to pass the examination on the OH&S Act, but this does not mean that he must ensure compliance. He can inform the user and employer of the provisions of the Act but he cannot compel them to comply. They have to face the music on their own feet. They can't say: "I employed an engineer to be responsible for health and safety and relied on him to comply with the Act". When cases come to court it is the precise words of the Act which are used and not vague impressions.

Continued in col. 2

The only area of the Act which could legally endanger the Competent Person is Section 37, the section on vicarious liability, and this only in his capacity of employee, not Competent Person. S37(3) makes it an offence for an employee to infringe a law or regulation for which the employer or user could be cited. So CP's keep your noses clean and when things go wrong say to your employer as the prophet Nathan said to King David, "You are the Man". □

Continued from Page 2

Section 37: Acts or omissions by employees or mandataries

This section spells out the principle of vicarious liability which means that an employer (and user) can be held accountable for the contraventions of an employee or mandatary. (A mandatary is a person or firm which is mandated by an employer to perform work on behalf of the employer, such as a contractor.) For an employer to escape liability he must prove to the satisfaction of the court the following provisions:

- (a) He did not connive with or permit the employee to infringe
- (b) The employee was not authorised to do that action
- (c) The employer took reasonable steps to prevent such acts or omissions.

These reasonable steps are detailed in Section 8: General duties of employers to their employees. Concerning a mandatary an employer should protect himself by writing into the contract who will be responsible for what to comply with the Act. This aspect would apply to a hired crane, scaffolding, ladders, electrical equipment, protective clothing, etc.

Section 31(4) brings the employee also in legal jeopardy for those same acts or omissions. □

Questionnaire for specialist database (from Page 1)

1. I do have a requirement for such a service in the following most likely categories:		
Name	-----	Categories (e.g. steam generation specialist, Electrical general)
Tel. no.	-----	-----
Member/ Non member	-----	-----

2. I consult as a professional / non-professional in the following specialist categories:		
Name	-----	Categories (e.g. steam generation specialist, Electrical general)
Tel. no.	-----	-----
Member/ Non member	-----	-----

LEGAL KNOWLEDGE

Act No 85 of 1993

November 1996 Question No 5

- (a) A user purchased a used boiler. Name TWO requirements that must be complied with before he may commission and permit the use of the boiler. (6)
- (b) Name THREE instances when a certificate of registration of a boiler shall lapse. (6)
- (c) Define 'registered person' with respect to lifts, escalators and passenger conveyers. (6)
- (d) The user of a lift is required to have it inspected at intervals not exceeding thirty six months. A report shows defects whereby persons may be endangered. The user has been informed about this. State in terms of the regulation the action that the user must take in the above scenario. (2)

Total Marks 20

Answer to Question 5

- (A) (i) Vessels Under Pressure Regulation (VUPR) 3(1) requires the user to have in his possession a certificate of manufacture showing that the boiler has been built according to an approved code of construction under the supervision of an approved inspection Authority.

(ii) VUPR 13(1)(a) requires an approved inspection authority to inspect and test the boiler after installation and then commission it.

(ii) VUPR 5(2) requires the user to apply for a Certificate of Registration by completing Annexure 1 and enclosing a copy of the inspection authority's commissioning certificate.
- (B) (iii) VUPR 5(8) states that a certificate of registration shall lapse:
 - (a) when it is cancelled by an inspector
 - (b) when transferred to another user
 - (c) when removed to another premises.
- (C) Lift, Escalator and Passenger Conveyor Regulation (LEPR) 1 defines a 'registered person' as a person who is registered with ECSA because of:
 - (i) his knowledge of the rules and specifications of these devices and
 - (ii) has practical experience of installation, testing and maintenance thereof.
- (D) LEPR 6(4) requires the user to stop the working of the lift and to prevent the starting thereof. ☐

Jokes

1. A young mother, paying a visit to her doctor, was making no attempt to restrain her five-year-old son who was ransacking an adjoining treatment room. Finally an extra loud clatter of bottles did prompt her to say: "I hope you don't mind Johnny being in your examination room, Doctor." "Not at all," said the doctor calmly. "He'll quieten down in a moment when he gets to the poison cabinet."
2. A young medical student was called to the dean's office. "Son," advised the dean, "you're doing pretty well here at college, but you must learn to write a little less clearly."

A CASE OF LOST RECORDS

A user of machinery prepared his boiler for statutory inspection. The overhaul of the appurtenances was contracted out. The contractor issued test certificates for all the valves. After the valves were returned to the user, a fitter noticed a 15 cm hairline fracture in the neck of the main steam stop valve. It was noted that welding had been carried out in the past in the same area of the fracture.

A new valve was obtained at great expense. The engineer suspected that the lateral stress on the valve could have caused the fracture to develop. Steps were taken to obviate this hazard at once.

A major disaster would have resulted had the fracture not been detected and had the fracture propagated at a later stage. If so, the common main steam line, now open to the atmosphere, would have facilitated the instant discharge of a 15 ton/hr coal fired boiler in addition to the boiler whose main steam valve ruptured. One or both boilers would have become complete write-offs. Structural damage to boiler room, loss of life, etc, etc may have occurred.

The user's attempt to find records of valve repairs or an entry in the logbook about the fracture cause were in vain. The obligation and the benefits derived from keeping a complete and continuous record of a vessel under pressure are very obvious. In practice this aspect of maintenance is often poor or neglected.

One may ask who authorised the welding repairs and under whose supervision were these done? Did anyone question the cause of the fracture before and what action was taken or should have been taken? Wisdom often comes after the event. A greater wisdom however is displayed by anyone maintaining complete and continuous records of all machinery which endanger the safety of persons.

One has little regard for the contractor who failed to notice the fracture, but my hat off to the bright spark who did and who possibly saved the day and much more. ☐

Adrian Wytjje

WHAT'S THE MORAL OF THIS STORY!

The following non-industrial accident was caused by a plastic garden chair:

The first day of a friend's annual leave was to be a real day of leisure. Sitting down in his garden chair, beer in one hand and book in the other, and leaning back he put his feet up on the balcony rail. All of a sudden the back legs of the chair spread outwards while the arm rests pushed inwards like a vice grip, caused by the force of his own weight. Three fractured ribs followed by months of pain and discomfort. Certainly take your leave but watch your chair because it might have plans to upset your programme. ☐