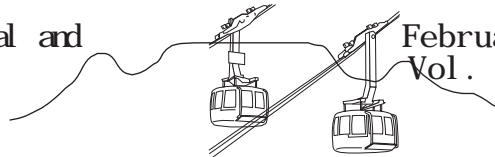


WCB ENGINEERING BULLETIN

The Institution of Certificated Mechanical and
Electrical Engineers
Western Cape Branch (WCB)

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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

Before us lies an exciting new year with all its hopes and fears, challenges and opportunities. Your local committee will continue to arrange interesting programmes, will continue to inform technical institutions and schools of the career path for Certificated Engineer, and will continue to press for the recognition of the Certificated Engineer not only as a maintenance manager but also as THE health and safety watchdog in the implementation of safety legislation.

This newsletter/bulletin will continue to serve the interests of Certificated Engineers. We would like it to meet real needs amongst the fraternity and to that end we invite active participation in its content: a telephone call or e-mail to make a suggestion, an article or two of helpful information, a new idea for its format, perhaps some odd-bod will even come forward and start re-writing safety legislation to make it simpler and more manageable. What could be simpler than having an engineering person trained in safety awareness stationed on each premises where industrial activity takes place be it manufacturing or building work? Working in close co-operation with experienced government inspectors this teamwork would reduce accidents far more than half-hearted compliance with little-understood regulations.

Yes, the bulletin could be a forum for exchange of information and ideas. Anybody like to write the next editorial? ○

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PATRON MEMBERS

Schneider SA (Pty) Ltd	Tel: 531-1722
Globe Engineering Works (Pty) Ltd	Tel: 448-4640
Cape Automation Systems CC	Tel: 511-2382
Improvair (WP) (Pty) Ltd	Tel: 797-9131
Dorbyl Marine (Pty) Ltd Ship Repairs	Tel: 47-5170
Drake & Scull (Pty) Ltd	Tel: 683-7056 Fax: 683-7088
Circuit Breaker Industries Ltd	Tel: 931-3125 Fax: 931-3120

Local Branch News

A HAPPY AND PROSPEROUS NEW YEAR TO YOU ALL. At the last committee meeting of 1998, the following members were elected to serve in listed positions:

Christopher Schnehage (Branch Chairman)

Mort Lyle (Vice Chairman)

Fanie Venter (Treasurer)

The remainder of the members are as reported on last Bulletin.

What does 1999 hold in store for us as Certificated Engineers? I do believe that the project commissioned by ECSA in terms of the rationalisation of the issuing of Certificates for Electrical and Mechanical Engineers will be resolved. This project will have an impact on the future Professional Registration of holders of such certificates and I can only advise any CE who has not as yet registered to do so as soon as possible. Should you need an application form, please do not hesitate to let us know and we will forward it to you.

ICMEE is well represented on various sub-committees of ECSA and those members are always on their toes to look after the wellbeing of the CE. However, without continued support of members and a growth in such membership, the tasks become more difficult to keep up. Reason being that we do not get enough of the right calibre person sitting on Council who could serve on these various sub-committees. I would like to encourage you to speak to any CE's who you may know who are not members, or persons studying towards the Certificate, to take up membership of our Institution. Once again, application forms are available from our offices.

Christopher Schnehage ○

Last Laugh

Sherlock Holmes and Dr Watson went on a camping trip. During the night, Holmes said: "Watson, look up and tell me what you see."

Watson said: "I see millions of stars."

"And what does that tell you?"

"Astronomically," said Watson, "It tells me that there are millions of galaxies and potentially billions of planets. Theologically, it tells me that God is great and that we are small and insignificant. "Metreologically, it tells me that we will have a beautiful day tomorrow. What does it tell you?"

"It tells me, Watson, that somebody has stolen our tent."

The Wanderer

DEMOLITION DANGERS

The managing director of a fruit farm (which was a registered company, and had refrigeration equipment) was responsible for the farm and the packing sheds where the grapes were packed. The company employed a Certificated Engineer. The director gave instructions to the farm foreman, George, on the method of demolition of a packing shed. First the roof and then three windows were removed leaving a long concrete beam spanning two end buttresses and a end gable wall which was 3 m high and 4.6 m wide. The work then came to a standstill for about a week while the labourers were engaged in other activities. During this period the Certificated Engineer came upon the partially demolished shed. He sought out the farm manager and enquired by whose authority the demolition was done. He was told that the managing director had given the instruction. He pointed out that demolition work was a dangerous exercise and he would like to be present at the further demolition as he was the Responsible Person for the premises. The manager promised to inform him when the work would be continued.

Four days later at 6:30 am the demolition work was re-commenced but the Cert Eng was not informed as he had requested. George the foreman and two labourers were working inside the building and two other labourers were outside. The men outside were trying to loosen the window in the gable wall with a crowbar. They had chosen the window job because they were both taller than the others. One of the labourers inside the building threw the end of a wire over the long beam with the intention of using the tractor to pull the beam down. The end gable wall suddenly fell outwards onto the outside workers and the beam fell at the foreman's feet. One man was killed instantly and the other died in hospital of this injuries.

The first that the Cert Eng knew about the event was when he awoke to the sound of the ambulance siren at 7 am. He immediately went to the scene.

The beam had not been supported in any way nor was the gable wall held up with strut poles. It had rained the night before, Neither the manager nor the foreman thought that the building was in a dangerous condition even though they had had experience in building work.

Comment

This tragic event underscores what happens when managers are at sixes and sevens with each other. The absence of communication and mutual trust may be considered the cardinal cause of this incident. The MD bypasses the Cert Eng and instructs the farm manager to demolish the building. The farm manager and farm foreman work out the plan for demolition. The Cert Eng accidentally comes upon the partially demolished building. He warns the manager of the dangers and obtains a promise that he will be informed when the work was to be continued. The manager promises but fails to keep his word. The work re-commences when the manager provides the labour to the foreman. In spite of the foreman's past experience he does not realise that hammering on an unsupported wall could bring it down.

General Safety Regulation 11(1) & (2) requires building work to be performed under the supervision of a person with at least two years experience, in this case of demolition work, and who is appointed in writing.

GSR 13 (a) requires shoring or other means to prevent accidental collapse of structure.

The employer in this incident has contravened the above regulations i.e. the company and the CEO, the managing director. Furthermore in terms of Section 37(3) of the Act the farm manager and the farm foreman can be charged with the same offences. The Cert Eng acted reasonably by warning of the dangers which he foresaw and requiring that he should be present and therefore could not be held to blame.

The Regulations distinguish between machinery and building work for the apparent reason that building work is a civil engineering faculty. The Cert Eng, however, has to study the theory of structures and strength of materials so one would think that on a factory site this aspect should be included in his responsibilities, just as machinery on a building site would come under civil engineering supervision. ○

Old Soldiers Never Die

Having mentioned Basil Mullon in the December Bulletin a call was received from Fred Peacock who knew Basil from schooldays in Zimbabwe. He had been a member for 36 years starting as a student member. He was keen to contact his old pal and Chris kindly gave the address in George.

Another old soldier is Gerald Brown who joined the Institution in 1943. In his own words: "I have been a member for approximately 56 years. I passed the Exam for the Works Certificate in 1940 and joined the ICMEE in 1943. I passed the Electrical Certificate in 1945.

"I served on the ICMEE Council for one year in 1965 in Johannesburg but declined further election due to pressure of work. I am also a Marine Engineer having passed the British BOT examination and am also a full member of the Institute of Mechanical Engineers London. I have held many responsible jobs in S Africa (Power Stations, Sugar Mills, Condensed Milk factory and Explosives & Chemicals). I was in full charge of all safety in all departments of the Regional Services Council of the Cape for 14 years as a pensioner and finally retired at the age of 80 years.

"The following incident may be of interest. During the War I had restricted employment in charge of a Condensed Milk factory which was an essential industry. There were two B & W watertube boilers and only one feed pump in very poor condition. On one occasion I was unable to get water to the boilers and had to withdraw the fires. I wrote to the director requesting a new pump, but was told to 'get on with my job', so I again wrote saying that in accordance with government regulations it was essential to have two efficient independent means of feeding boilers and unless I had a replacement forthwith I would have no alternative but to report them to the Chief Inspector of Factories. I had a new feed pump delivered by passenger train to Franklin East Griqualand factory.

"Engineering has advanced so rapidly today that apart from being almost blind and deaf I would be lost on a modern plant." ○

Fathers

A father is the man who lies awake worrying about the spanking he's given his child when the child has forgotten it and gone to sleep.

Children give their fathers the chance to be the man they would have like to be. For a little while.

It's easy, when your child believes you are always right, to slip into believing it's the truth.

Pam Brown quoted in "For Father with love". ○

LEGAL KNOWLEDGE - NOVEMBER 1998

QUESTION 3

(a) State whether the following statements are TRUE or FALSE in respect of the environmental regulations for work places:

- (i) "WBGT index" means a number that characterises ventilation conditions. FALSE
- (ii) All work places must be provided with artificial lighting having a lux value in accordance with illuminance value specified in the tables. TRUE
- (iii) The window area of all work places must be at least one-tenth of the floor area. FALSE
- (iv) All work places must be ventilated by natural as well as mechanical means. FALSE
- (v) The user of machinery must provide 2.25 square metres per person of clear and unobstructed space around each machine. FALSE
- (vi) The employer of employees working indoors must make sufficient clear and effective open floor space for every employee. FALSE
- (vii) Work places where equivalent noise level exceeds 85 dB(A) the employer needs to do nothing more than to demarcate the area and provide hearing protectors. FALSE
- (viii) All employers must take measures to be informed of any imminent flooding. TRUE
- (ix) The employer must ensure that all work places are provided with at least two means of egress situated as far apart as is practicable for use in case of fire. TRUE
- (x) The employer, having regard to the size, construction and location of the work place, can decide on the adequacy and suitability of fire fighting equipment. TRUE

(10)

(b) An employer is required to construct a flammable liquid store. State FIVE regulation requirements that must be complied with.

GENERAL SAFETY REGULATION 4(10) states:

(10) [20]

An employer shall cause every flammable liquid store to be -

- (a) separated by means of fire-resisting material with a fire-resistance of two hours from any room, cabinet or enclosure contemplated in subregulation (2)
- (b) constructed of fire-resisting material with a fire-resistance of two hours
- (c) constructed in such a way that, in case of spillage, a volume of the flammable liquid ordinarily kept in store plus 10% of that quantity, can be contained
- (d) ventilated to the open air in such a manner that vapour cannot accumulate inside the store, and
- (e) clearly marked with a sign indicating that it is such a store and also indicating the amount of flammable liquid which may be stored therein. ○

OCCUPATIONAL HEALTH & SAFETY ACT No 85 of 1993

Issue No 16 General Safety Regulations (GSR)

GSR 4(12) Use of flammable liquids on Building Sites. No fire or explosion hazard must be created and areas must be effectively ventilated, failing which PPE must be provided such as an approved respirator, mask or breathing apparatus.

GSR 5 Work in confined spaces.

- GSR 5(1) A gas free certificate must be provided by a person who is competent to pronounce on the safety of the space.
- GSR 5(2) Where there is hazardous gas, vapour dust or fumes or reduced oxygen the space must be purged and ventilated and isolated from all hazardous sources.
- GSR 5(3) Where the space cannot be purged, ventilated and isolated the following is required:
 - (i) approved breathing apparatus
 - (ii) a harness and rope whose end is attended by another person who is trained in resuscitation
 - (iii) additional breathing and resuscitation apparatus available outside.
- GSR 5(5) Where the atmosphere is explosive or flammable the concentration of gas, vapour, dust or fumes must not exceed 25% of its lower explosive limit if the work could create a source of ignition; otherwise the concentration must not exceed 10%.
- GSR 5(6) Work in elevated positions must be performed from a ladder or scaffold.
- GSR 5(7) Danger of engulfment. A safety belt and rope must be provided and a person in attendance outside keeping worker under observation. ○

To be continued

QUO VADIS Y2K COMPLIANCE?

The year 2000 is less than 11 months away and it is time to feel jittery if provision has not been made for that event when the two digit year must be replaced by the four digit year. With the introduction of computers which are based on counting numbers in sequence and with the conversion of analogue to digital, problems are now on the horizon which were not anticipated until the last few years. The problems are being tackled by the boffins and have probably to a large extent been contained in new equipment, but there will be numerous conversions which will have to be made, many on an astronomical scale. But what about the small fry, the home PC used for browsing on the internet and transmitting e-mail? Must we throw away the old equipment and buy the latest? Will we be able to programme the video or the microwave and do electronic banking by telephone? Will my monthly pension be paid regularly and my endowment policy mature on due date?

A newspaper item warns that "only a quarter of the country's 843 municipalities are taking action to avoid a meltdown of their computer systems on January 1 in year 2000".

South Africa is apparently the 10th most Y2k aware country in the world, so one wonders what is happening in some other places.

In fact, problems are already being reported. In Switzerland, hospital systems have already started to crash when bookings have been attempted into the year 2000. Tests in local hospitals have demonstrated similar problems. These and other critical programs are being updated or replaced in the W-Cape and elsewhere, at great cost. All is not bad, however, as the Y2k problem has acted as a wonderful opportunity to rewrite legacy systems. This would probably never have been done if the crisis was not precipitated (a bit like the rebuilding of a city after war or earthquake?) The bad side, however, is that some companies are forcing users to upgrade software features at the same time, even if the new features are not needed or actually wanted. These companies thus force their customers to either abandon a multimillion rand machine (because it won't work after yr. 2000) or buy ridiculously overpriced upgrades of proprietary operating software. There is a great deal of information on the Internet. Most manufacturers now have websites, and many now publish information on the Y2k status of their products.

Apparently some people are worried about even bigger things. Russia (according to a 'Net article) is now also testing all its nuclear reactors and war installations to see if they are Y2k proof. One hopes that the tests don't themselves cause a misfiring of a nuclear missile!

Microsoft are also apparently having problems. One of their products, FoxPro, apparently has Y2k problems – so it might be wise to check this out if you have any spreadsheets etc. that utilise this program. The DOS version of MS Word 6 is also suspect, as is Windows 3.1. ○

PLANT ENGINEERING

November 1992 Question 6(a)

The candidate is required to explain and illustrate with sketches a method of reclaiming energy from

- (i) the constant supply of wood shavings and lumber waste produced from the manufacture of furniture OR
- (ii) a mine which has methane gas. (10 marks)

Answer to Question 6(a)(ii)

Methane gas in mines is the scourge of miners as it is extremely dangerous. By the cruel ironies of life it is also an excellent fuel. Money has to be spent by any mine which can have a methane problem so as to control it. If the methane can be tapped and used it can redeem the money spent on the control measures. The component parts of such a scheme would have to encompass

- detection equipment
- extraction equipment
- means of transporting the gas (pipe line, et al)
- means of purifying the gas (scrubbing plant)
- storage facilities, possibly involving compressor plant
- means of obtaining value from the gas by either burning it (in boilers and engines) to provided energy which would cost money if obtained from some other source OR
- selling it for reward.

The recovery plant, as distinct from a disposal facility, will have an annual overhead, capital expense and also an annual operating expense which could be based on kilograms of gas recovered. The "income" generated by the gas plant could be based on joules produced costed at the rate of the alternate source. These are the constituents of the classical break-even graph and management would have to initially make a projection along these lines to test the viability of the concept and if such a plant is installed continuously vet its economic performance to determine if its operation is justified. Note The answer to part (i) would be along the same lines and the break-even graph would be on the same basis.

