

Dockworkers struggle

This article is about the struggles of members of the Transport and General Workers' Union (TGWU) over the past five years to protect themselves from lead, the problems they encountered, and the successes they achieved.

They work as stevedores loading lead concentrate from train and into storage bins in a shed. When a cargo ship comes into port they load the lead onto tractor trailers and transport it to the holds.

The lead has been partly refined, and is dried out because it has to have a low moisture content or else there is a danger of the cargo ship capsizing at sea. So the lead is dry and dusty. There is lead dust everywhere at the workplace.

The stevedores were worried that the lead was harming their health, and approached management to solve the problem. Blood samples were taken from the stevedores and analysed by the laboratories of the mines which supply the lead.

The mine laboratories assured the stevedores that the amount of lead levels in their blood was acceptable, even though they were up to three times the normal amount. The stevedore management issued the workers with masks to protect them from the dust, but admitted that the masks are ineffective against the high levels of dust.

At this stage (July 1984) the union asked the Industrial Health Research Group to investigate the problem.

Investigating the problem

We met with the stevedores, then inspected the workplace while they were off-loading trains. The workplace was badly polluted with bad dust. To find out how bad it was, we did eight measurements of the lead in

The dangers of lead exposure have been known for hundreds of years. In 1786 Benjamin Franklin expressed concern that for over 60 years this 'useful truth' had not been 'generally received and practised on'. Over two hundred years later, this is still the case in South Africa.

We still don't have a regulation governing exposure to lead, despite the terrible conditions reported in the 1976 Erasmus Commission of Enquiry into Occupational Health. The Commission revealed that when 3745 lead workers in 60 different factories were tested, it was found that they had such high levels of lead in the blood that nearly half of them would be taken off work if Swedish standards were applied.

The levels of lead in air in the factories were up to 73 times

against lead poisoning

the air using samplers worn by workers. We found that all the levels were much higher than the limit of 150 micrograms of lead per cubic meter of air accepted in the USA. The levels we found ranged from twice to 69 times the US limit.

The next thing to find out was whether the lead was getting into the workers' bodies. There are many blood tests to test how much lead is being absorbed by the body. The most common test is the blood lead level.

as high as the maximum allowed in factories in the United States. In fact, the Commission said that 'exposure in the Republic is so high that, if the factories in which the investigations were carried out had been situated in the USA or Sweden, they would have had to close'. (Erasmus 1976).

Sets of draft lead regulations have been published for comment, but these fall far short of the United States, Swedish and German legislation. After the first set of draft regulations was published, recommendations were made for improving them in order to give workers better protection. But there is not much sign of these recommendations being followed in the second draft. We have to wait for the final version before we can judge how effective they will be. ☆

Lead only stays in the blood for a short time, after which it is excreted from the body or stored in other parts of the body. So the



blood lead tests shows *recent* exposure to lead. Other tests are better at showing the exposure *over a longer time* and the total amount of lead stored in the body. We chose to do the zinc protoporphyrin (ZPP) level to look at this aspect. Both tests (blood lead level and ZPP) showed levels above the normal in the majority of workers.

Solving the problem

Solving the problem of lead exposure in this workplace was not an easy task. Our tests had shown that the workers were exposed to a real danger, and they needed protection. Together with the workers we discussed the usual ways to protect people from dust to see whether they could be used here, and how well they would work.

1. **Mechanisation.** Sometimes part of a job can be done by a machine in order to reduce the danger to workers.
2. **Substitution.** When we stop using a dangerous substance and use a safe substance instead, we call this substitution. Substitution would not work, because

the cargo itself is lead.

3. **Enclosure.** When a dangerous substance is handled by a few workers, or it only escapes from one source, then that area, process or machine can be enclosed to isolate the danger. The process could not be enclosed here. All the workers handle lead and it is found in every part of the workplace.
4. **Ventilation.** The best kind of ventilation is extraction ventilation, which sucks the dust into a hood right next to the source of dust. Extraction ventilation would not work here, because there are many sources of dust. The dust came from all over.
5. **Wetting the dust.** Wetting the dust means less dust. But wetting the dust was out of the question in this case as the lead has to be dry when it is loaded onto a ship, otherwise there is a danger of the ship capsizing.
6. **Personal protective equipment.** If the hazardous substance can be breathed in and it cannot be removed by ventilation, workers must be given effective protection against breathing the dust. This is not the best way to protect workers because there are problems with masks and respirators. They can be uncomfortable and cause skin problems and sweating. They can also leak and make it difficult to communicate with other workers and to see properly. As described above extraction

ventilation was not possible, so we discussed the different kinds of masks and respirators with the workers. They chose to try out airstream helmets. Airstream helmets blow a stream of fresh air over the face of the worker, so he/she does not breathe the dirty air. We tested the helmets to see how much dust got inside them while the stevedores were working. These tests showed that the helmets provided good protection. After they had tried them out, the workers decided to negotiate for them. We had a training session on how to use the helmets and three workers were trained to clean them and change the filters.

7. **Housekeeping.** A workplace which is contaminated by dust or chemicals from the work process must be cleaned regularly and carefully. Cleaning was a problem in this workplace. The workers used to clean up the lead which spilt on the floor with brooms and squeegees, but these made even more dust for the workers to breathe in. We recommended that they stop using brooms and squeegees and the union decided to negotiate for efficient vacuum cleaners to pick up the dust.
8. **Laundrying.** Dangerous substances like lead dust can contaminate work clothes. Workers must not eat in dirty overalls and they must not take them home to be washed. The

stevedores decided to negotiate for a change of overalls before their lunch break.

9. **Washing facilities.** In workplaces where there are dangerous substances, it is especially important to have adequate washing facilities and time off for washing before tea and lunch breaks to prevent contamination of food. The stevedores decided to negotiate for an extra ten minutes a day to wash before breaks.
10. **Training.** Workers must know about any dangers of the substances they work with and ways to prevent damage to their health. They negotiated for time off for training.
11. **Maintenance and monitoring of problems.** After controls are introduced, they must be maintained and monitored, so that any problems are picked up quickly and sorted out. The stevedores decided to elect a safety representative to maintain the airstream helmets and keep a log of problems.
12. **Health monitoring.** Workers exposed to lead must be checked for health problems and must have blood tests done regularly to measure their exposure. The committee negotiated for six-monthly blood testing. They were dissatisfied with the service provided by the company doctor and negotiated for the tests to be done by a doctor of their choice. Two different

blood tests were used: the blood lead test (to show how much lead the workers get into their bodies over a few days) and the ZPP test (to show how much lead the workers store in their bodies after longer exposure).

Following up: did it work?

The union negotiated all these control measures successfully and they were all introduced within a year of the first survey. In the next 3½ years, the workers had five more blood tests to check whether they were being protected from the hazard of lead. We will now describe the results of these tests, and also what was happening in the workplace at the time.

The first problem we had in looking at the results was that there is a high turnover of stevedores. Although we took blood from 65 different workers during this period, only between 25 and 33 workers are employed there at any time. So we looked at the test results of the workers who had been there every time that tests were done. We found that there was a significant drop in the levels of blood lead and ZPP between the first test and the sixth test. But also we found that the levels went up suddenly in April 1987 before coming down again in September 1987. We think that this was because of problems in the workplace. **These were the problems:**

1. The airstream helmets began to give trouble. The workers complained that they were hot and uncomfortable to wear. It took a

few weeks for the suppliers to find out what caused the problem. They found a fault in the batteries for the fan that cleans the air flowing over the face. They fixed them, but by that time the workers were not happy about wearing the helmets. They only started to wear them again after they had another training session.

2. The amount of lead handled by the port doubled towards the end of 1986 and in 1987. This meant that the stevedores were exposed to more dust during this time.
3. A cargo of lead arrived that was too wet, so it was rejected by the ships. It was left to dry out on the floor of the shed for three months, so there was more dust and also the workers could not clean the floor during this time.
4. The washing machine broke down, and was only repaired months later, so the overalls had to be washed by hand. This meant that workers could not change their overalls twice a day and they had to eat in dirty clothes.

We think that these four events explain why the blood lead levels went up in April 1987. By the next time the bloods were taken, the helmets were working again and the lead was no longer stored on the shed floor. So the blood lead levels dropped again to a lower level. The ZPP levels dropped throughout the time of the study, except for a slight rise in April 1987, for the same reasons.

What can we learn from this study?

Firstly, we can see that not everyone agrees about what is unhealthy. There are also differences between countries in the blood lead levels that they consider safe. The draft regulation in this country would allow workers to have blood lead levels of 80 before they have to be taken away from working with lead. In the United States workers are taken off lead jobs when their blood levels reach 50.

Secondly, workers must be involved in the programme to control the dangers if the programme is going to work. The masks and respirators provided by management didn't work properly. Respirators must be tested in the workplace for efficiency and comfort before a final choice is made. **Thirdly**, health problems in the workplace often do not have just one simple solution. In this workplace, many different controls had to be introduced to solve the problem effectively.

Fourthly, negotiating controls is not the end of the problem. Even in this workplace, where the union negotiated a whole programme of control, there were problems later. It is important to have a system of monitoring and maintenance to make sure that the controls continue to work.

Lastly, it is important to have ongoing training to inform new workers and to remind old workers of their rights, the dangers of their work and the way those dangers can be controlled. ☆