Researching Workers' Health at the Port Kembla Furnaces

In the Belly of the Monster

Local people say that the name "Wollongong" was an Aboriginal term for "see the monster comes". Whether or not this is true, today the mythology appears to have come to life. Looking from the heart of Wollongong across the industrial landscape to Port Kembla, the skyline is dominated by the steelworks' two working iron blast furnaces which seem to rise out of the ever-present polluted mists.

This isn't just an illusion of the casual observer. The closer one gets to the furnaces, the more overpowering they become. On the cast house floor of the furnace, workers are subjected to extreme heat, with radiant heat levels near tapholes between 80 and 100 degrees Celsius, high levels of noise, coke and iron ore dust, metal fume and choking sulphur gases from large slag pits below the furnace. When the metal is cast, it runs across the length of the furnace floor in open sand-lined channels, and pours into waiting brick-lined railway ladle wagons. This snaking river of molten metal poses a danger of burns from sparks and splashes. Workers must remain constantly wary while they are tending the cast. The patterns of work, rest, eating and drinking are determined by the often unpredictable casting schedules of furnaces which are operated 24 hours a day. The rest breaks represent a respite from burning throats, stinging eyes, coughing, searing heat and hard work. Even the most experienced blast furnace worker remains a physiological outsider in this hostile environment. The senses never fully adjust.

Iron production is the result of complex chemical reactions within these huge furnaces. It is these reactions which also produce what is probably the most serious and life-threatening of all the many hazards present on blast furnaces — the asphyxiating gas, carbon monoxide.

To this dangerous gas, the International Labour Organisation (ILO) attributes at least one-third of all industrial deaths due to poisoning. Carbon monoxide (CO) displaces oxygen from the carrier protein, haemoglobin, in the red blood cells. It has an affinity 200 times higher than oxygen, for haemoglobin. At lower

Occupational health scientific research has often been criticised for being irrelevant, mystifying and for using workers as guinea pigs. Can scientific research be part of the trade union movement's efforts to improve health and safety conditions in Australian workplaces? A recent research project provides insights into this problematic area.

Autumn 1985
In an integrated steelworks like those at Port Kembla and Newcastle, where blast furnace gas is recirculated as a heating fuel, literally thousands of workers are potentially exposed to carbon monoxide gas. Other major production units, such as coke ovens and basic oxygen steelmaking furnaces, also have carbon monoxide present in byproduct gas.

Carbon monoxide is not confined to the steel industry, but represents a danger to workers across the whole spectrum of manufacturing and transport industries.

**The Hazard Becomes Visible**

In the middle of 1982, in Australian Iron and Steel's Port Kembla steelworks, on the No. 4 blast furnace, a trademan's assistant suffered a heart attack which was immediately fatal. Within an hour of the fatality another worker was gassed, but recovered consciousness shortly afterwards. Both incidents occurred in an area where it was known that blast furnace gas was often present.

The Port Kembla Branch of the Federated Ironworkers' Association, the union which covers production steelworkers, with the Lidcombe Workers' Health Centre, commenced an investigation into the circumstances surrounding both incidents. The union is convinced that carbon monoxide contributed to the fatal heart attack, and was present in high concentrations when the second worker was overcome.

Despite evidence being uncovered of previous gasings, and several incidents of more workers being overcome by gas in the months that followed, Australian Iron and Steel, to this day, has steadfastly denied any connection between carbon monoxide gas and the incidents.

Since this time, the union has been demanding better protection from the hazard of carbon monoxide. These demands have centred around two claims. The first is that integrated electronic automatic alarm systems be installed in all areas in which carbon monoxide is potentially present. The second is that appropriate engineering controls and improved maintenance procedures be instituted.

The company, which is a fully owned subsidiary of BHP, has never wavered from its position that present CO monitoring arrangements in the Port Kembla steelworks are adequate.

Carbon monoxide monitoring at Port Kembla consists of a very small number of automatic CO alarms and the use of hand-held monitors. There is no integrated automatic alarm system in the high risk blast furnace and coke ovens production areas. The union asserts that the company has resisted the introduction of carbon monoxide alarm systems in these areas because high levels are often present, and activated alarm systems represent potential disruption to production. The limitations of hand-held monitors are evidenced by the fact that some workers have been gassed while using them.

**International Guidelines Ignored**

In November 1981, the International Labour Organisation convened a meeting in Geneva of a committee composed of government, union and company representatives, to draw up a code of practice for occupational health and safety in the iron and steel industry. The committee included a Mr. P.J. Laver, then General Manager of Mt. Newman Mining Company (a subsidiary of BHP). By the middle of 1982, Laver had become the General Manager, Operations, Steel Division, of BHP.

The code of practice, published in 1983, provides that "special precautions should be taken to protect blast furnace workers and other workers potentially exposed to blast furnace gas and other gases containing large concentrations of carbon monoxide".

This protracted dispute has involved the government inspectorate, the NSW Division Of Occupational Health. Inspections by the Division, including sampling of carbon monoxide levels, took place at the Newcastle blast furnaces in May and June 1981 and at the Port Kembla blast furnaces in October and November 1982. Prior to the division's inspection of the Port Kembla furnaces, the union inspected...
the furnaces with a doctor and scientist from the Lidcombe Workers' Health Centre, and drew up a testing program which the division was asked to follow. The union paid for its delegates to spend their working time accompanying the division inspector while he was on the furnaces. At both Newcastle and Port Kembla, the division found high levels of carbon monoxide.

At Newcastle, the inspector reported "exposures, particularly downwind of the furnace, of some significance during most of the shift...." and considered that "carbon monoxide exposures on No. 1 furnace are likely in excess of the TLV (Threshold Limit Value)". At Port Kembla, the inspector reported "highly variable levels of carbon monoxide .... ranging from very low levels to levels in excess of the Short Term Exposure limit, depending, in part, on specific operations, presence or otherwise of leaks and weather conditions." At Port Kembla, the division arranged to test volunteers on each furnace for blood carboxyhaemoglobin levels. Only five workers were tested over one shift, with some workers declining to participate.

The division made no recommendations concerning automatic system monitoring and control of carbon monoxide at Newcastle, except to say that the importance of the "significant" exposures could "best be ascertained by measuring blood carbon monoxide levels (carboxyhaemoglobin) of the furnace crews at the end of the shift, and it is suggested that such measurements be done".

At Port Kembla, the division made three recommendations. The first was for the introduction of more sophisticated hand-held monitors for use by the Gas Watchers. The second was that "the possibility of mechanical removal of effluent gases during emptying of the Dust Catcher on No. 4 Blast Furnace should be investigated". It was defects in this system which the union believes were responsible for a number of gassings in 1982. The third recommendation was that "the company should make available a suitable screening test for carbon monoxide exposure for any employee who feels that he or she has been excessively exposed to Blast Furnace Gas".

Behind the Australian Iron and Steel Curtain

By early 1984, neither the company nor the NSW government inspectorate had indicated that they were prepared to implement a carboxyhaemoglobin testing program.

In January 1984, assisted by the Port Kembla Branch of the Ironworkers' Union, the Lidcombe Workers' Health Centre made a submission to the Department of Employment and Industrial Relations for research project funding.

The union and the health centre proposed to properly investigate the extent of blast furnace workers' exposure to carbon monoxide, using carboxyhaemoglobin measurements, and as an exploratory study, to look at the incidence of symptoms occurring at the end of the shift likely to be related to CO exposure.

Thus, the implementation of the NSW inspectorate's recommendations was being initiated by a union, assisted by workers' health centre researchers, and funded by a federal government research program within the broad commitment of the ALP/ACTU Accord. The funding application was successful, and work started on the project in July 1984.

The union and the researchers faced what appeared to be two big problems. These were the issues of co-operation of workers in a blood testing program, and access to the steelworks.

The more crucial was the question of co-operation from the workers. It had been said that the multilingual workforce would refuse to co-operate, particularly for the taking of blood. But, for practical and ethical reasons, each worker's co-operation was essential for the project to go ahead. The blast furnace workers had, through the union, pressed for improvements on the furnaces; at union meetings, the problem of carbon monoxide had been discussed and action urged. However, the project was the first of its kind in the steelworks, and represented a considerable step forward into uncharted territory for the union and its members. On the face of it, little

"Could I say something Commissioner? A.I. & S. have already done one test on No 5 Blast Furnace, they came back with the results and we weren't satisfied with the results, but the gentleman who came back with the results, I asked him 'what about this grab fire going on in here?' He says 'they are doing no harm'. I said 'what about the slag pits, the fumes?' He turned around and said, 'do you no harm'. Well we don't believe that. This is why we want someone from the outside. We brought this up with the union, this is why the union is here today.'

confidence could be gained from the apparent failure of the government inspector’s efforts, which resulted in the testing of only a very small number of workers. However, such pessimism proved to be unfounded. Workers overwhelmingly supported the project. For purposes of comparison, the study required a control group of volunteers from sections of the steelworks not affected by carbon monoxide.

There was a number of reasons for this positive response. Many workers believed that regular medical screenings should be introduced in the industry. The testing program was therefore seen within an overall context of union-based occupational health care. There can be no doubt that workers were suspicious of any testing that could jeopardise their continued employment by providing the company with information to weed out the less fit, or “unsuitable” workers. It must be remembered that this project occurred in an industry which had been hit very recently by retrenchments and was undergoing extensive restructuring. The company had attempted to sack injured workers during this period, and was prevented from doing so only by union action. Union delegates were elected onto an ethics committee to safeguard workers’ interests and formally passed a resolution that the results of individual worker’s tests would be available only to the worker and the researchers.

The extensive involvement of migrant community health workers from the Illawarra Regional Migrant Health Unit at Cringila was crucial. A large number of job meetings were held on all shifts. Many of the meetings were, in fact, informal discussions between the researchers, health workers and furnace workers.

A flow of information and support developed which was only possible due to the rapport which developed between the workers and bilingual health workers. The project was extremely fortunate in being able to employ a Yugoslav doctor, experienced in occupational health, who spent many hours on the furnace discussing and explaining the project, particularly with the large number of Yugoslav blast furnace workers. The term “subject” is inappropriate to describe people who were very much active contributors to the project.

The final element in the successful implementation of the project was the participation of the union in all aspects of its development. Apart from the formation of the Ethics Committee, meetings of blast furnace delegates were held early in the project to sort out practicalities and to establish the protocol. While testing was proceeding, delegates and workers gave invaluable assistance and advice. In particular, information regarding usual work practices, and a working knowledge of potential hazards, including gas leaks, brought to the project a perspective rarely found in scientific research. A major part of the design of the project is the production of multilingual information and provision for paid meetings to explain and discuss the implications of both individual and groups results.

The second problem, less serious to the viability of the project, was BHP’s track record in attempting to prevent access onto company property by union occupational health consultants.

Delegates participated in negotiation sessions with the company regarding plant access. Initially, the company was opposed to this involvement with the delegates, but such involvement was a matter of principle for the union and important for the resolution of the question of access. After principled agreement was reached, a working party was formed consisting of company representatives, researchers and the union, including the delegates.

The researchers had organised to test workers at a local community health centre situated close to the steelworks. However, access to the blast furnaces, although not vital, would allow the researchers to measure environmental carbon monoxide and heat levels, and to carry out general observation of the work processes during the workshift. Eventually, BHP agreed to co-operate with the research on conditions which were acceptable to the union and the researchers. For the first time in the Australian steel industry, a scientific environmental testing program, with full participation by the workers, was under way.

Implications of the Project

The results of this study will be published when they have been fully analysed. Whatever the findings of the study, the issues raised by this project are significant for a number of reasons. The conducting of the research has wide implications for trade unions and scientific research. We know of no previous examples by this project for a number of reasons. The conducting of the research has wide implications for trade unions and scientific research.

We know of no previous examples
of Australian research into health conditions in the steel industry that is published and publicly accessible. This fact alone makes the project significant.

- The need for such a project was first raised by the union within the context of the failure of the NSW inspectorate and the company to adequately investigate the problems of carbon monoxide exposure. There is a growing understanding in the union movement that scientific research can be a useful tool in improving industry occupational health standards. In the steel industry, in particular, BHP and successive state governments have failed to employ the considerable resources at their disposal to investigate adequately and eliminate serious workplace hazards. The picture in Australian manufacturing industry overall is as bleak. The paucity of Australian research testifies to both the neglect of past governments and the power of big corporations.

- Unions and their members are often suspicious of scientific research and its aims. The long history of time-and-motion and work assessment studies provides a sound basis for this suspicion. The emergence of predisposition screening, used to fit the worker to the job, rather than to improve workplace conditions, means that unions must protect their members' interests at all times in relation to scientific research. If there are to be more studies like this one, there is a real need for the union movement, assisted by workers' health centres, to develop a Code of Practice for the conduct of occupational health research.

- Trade union based scientific research is directed at solving workplace problems. As the development of this project illustrates, unions and workers' health centres are uniquely placed to identify severe occupational health problems which persist in Australia. For trade unions, research is part of the process of cleaning up the workplace, and is not done for its own sake. The value of this research to the workers cannot be confined to its technical findings. It should be remembered that this project to assess biological effects on workers took place in a workplace that did not even have a basic emergency warning system. Although it could be said that it was a bit like studying the effects of water immersion on the sinking Titanic, the urgency of solving the problem was poignantly underlined in the last week of the testing, when news reached Port Kembla that two Newcastle steel workers had been fatally gassed by carbon monoxide on the coke ovens. A week later, the company refused yet again to install an automatic alarm system in the Port Kembla coke ovens.

- Hopefully, the funding of the Port Kembla CO project and other union-based projects is the beginning of a new approach by the federal government, which will lead to many more union-worker health centre projects being government assisted. An essential ingredient in this strategy is the government funding of workers' health centres throughout the country, to a level which ensures their viability. Such developments are crucial to the implementation of the occupational health and safety sections of the ALP/ACTU Accord.

What is at stake here is whether important and often contentious occupational health research will ever take place in Australia. Occupational health research projects must be government funded and conducted by trade unions in conjunction with workers' health centres; the alternative is research largely shaped by the priorities of companies concerned primarily with holding costs down. Effective occupational health research can only be undertaken within the context of genuine workers' participation. Against pervasive and subtle corporate pressures, this participation is, finally, the most effective defence for committed, useful and ethical research.

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