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The Mines Health and Safety Bill 1996 – A New Era for Health and Safety in the Mining Industry

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INTRODUCTION

The Mines Health and Safety Bill (MHSB), currently past its first reading in parliament with support from all parties, ends an 85-year-old regime for health and safety in the South African mining industry, which has for many years lagged far behind comparable regimes in Europe, North America, and Australasia. The Act will substantially alter the culture and politics of health and safety activities in the mining industry, thereby contributing significantly to the aims of the Reconstruction and Development Programme (RDP) in the areas of health, housing, education and employment in the society as a whole. The mining industry is likely to remain South Africa's premier foreign exchange earner for some time to come. It will also continue to promote both a significant source of energy and raw materials for downstream beneficiation, and a domestic market for suppliers of equipment. Most importantly perhaps, the industry is one of the largest employers in the country, employing over half a million people, many of whom are foreign migrants whose home economies depend upon earnings from the South African mines. To date, the mining industry and previous governments have paid only lip service to the health, welfare and

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working conditions of this enormous and vital group of workers. It is appropriate, therefore, that the MHSB virtually coincides with the adoption of the new Constitution — it might be regarded as a new 'constitution' for the mining industry.

The leading role of the National Union of Mineworkers (NUM) and its allies must be acknowledged in the process which has resulted in this legislation. During the 1980's the NUM placed health and safety organization and activity at the top of its agenda despite lack of recognition, indifference and even outright hostility from the state and employers. In the early 1990's the NUM called for tripartite discussions over the economic future of the mining industry and tabled a demand at those talks for a commission of inquiry into health and safety in the industry. The mining summit discussion failed to reach any consensus on economic strategy issues for the industry, but the NUM pursued its proposal for an official inquiry into health and safety. Eventually, the Nationalist government agreed to convene the Leon Commission of Inquiry into Safety and Health in the Mining Industry. In the months leading up to the opening of the commission's hearings, the NUM consulted a wide range of persons with specialist knowledge of the SA mining industry in order to gather as much evidence as possible of the past neglect of health and safety in the industry, and to formulate practical proposals for change. NUM members also gave evidence at the commission hearings. These initiatives contributed more than anything else to the success of the Leon Commission.

The NUM was also instrumental in the earlier drafts of the legislation. An ex-official of the NUM was one of the commissioners overseeing the recent public inquiry into the crash of a railway vehicle down a mine shaft on to over a hundred men in a cage at Vaal Reefs gold mine. The unprecedented transparency of the proceedings, and the recommendation for prosecution of those considered culpable (including a mine manager and two senior mine officials) give us a preview of the intention of the MHSB. That intention is to institute open, publicly accessible inquiries designed to uncover structural causes of injuries and deaths underground. The refusal of the commission to recommend prosecution of the mineworker who happened to have his hand on the controls at the time of the accident (in this case a locomotive driver) broke with a long tradition in South Africa of secretive inquiries designed to attach blame to powerless individual mineworkers and to exonerate the existing inadequate safety arrangements and those responsible for perpetuating them.

In the light of its exemplary record of struggle for the health and safety of its members, the NUM can legitimately claim most of the credit for the MHSB. It is also clear that the success of the legislation in improving working conditions in the mining industry will be seriously undermined by any future attacks on the legitimacy, independence and freedom of the NUM to act.

THE CONTEXT OF THE MHSB

For the past 85 years, the safety of South African mineworkers was provided for in the Mines and Works Act (1911) and its many regulations. This legislation formalized the racially inspired chain of command and responsibility in the industry. Occupational health was artificially separated from safety and was dealt with by various statutes administered by the Department of Health and National Population Development. These statutes defined the legal responsibilities of mine managers to provide surveillance of miners' respiratory health, and to finance a compensation fund for occupational lung diseases certified by the Medical Bureau for Occupational Diseases (MBOD). Both the surveillance system and the compensation system for diseases were racist because the state surveillance system was not open to black mineworkers, who had to rely on mine doctors paid by mining companies, and because monetary compensation for lung diseases for black mineworkers was historically small compared to that for white mineworkers.

The Mines and Works Act of 1911 froze the colonial power relations between mine owners, white mineworkers and black mineworkers. There was no provision for representation of the vast majority of black mineworkers on health and safety matters at either mine or national level. Furthermore, the individual black mineworkers had no right to withdraw from dangerous situations unless given permission to do so by a white miner, whose wage was supplemented by production bonuses. Black mineworkers also had no control over mine health services, either at mine or at national level. Induction training for ordinary black mineworkers was limited to acclimatization to heat, and a general requirement on 'persons in charge of workmen' to 'acquaint' them with the regulations (note *not* the health and safety risks) concerning them, or pertaining to particular occupations and duties.

As a result of this legal and political system, 69 000 mineworkers died in the first 93 years of this century, and more than a million were seriously injured.[1] In 1993 the government mining engineer's statistics showed that there were 1,54 mineworkers killed and 25,8 seriously injured for every 1 000 workers exposed to underground risk in all sectors of the industry.[2] The vast majority of injuries and deaths occurred at or in underground mines (99%). Of these, the gold mines were the most dangerous, accounting in 1993 for 85,6% of all reported injuries and 72,7% of all reported fatalities. 61,7% of gold mining fatalities (263 lives in 1993) were due to underground rockbursts or rockfalls. The next most dangerous subsector in 1993, the coal industry, was responsible for 15,4% of all mining fatalities.[3] Table 1 compares the performance of

[1] Commission of Inquiry into Safety and Health in the Mining Industry *Report* vol 1 (1995) (Leon Commission).

[2] Leon Commission *Report* vol 1 at 26.

[3] All figures from Leon Commission *Report* vol 1 ch 3.

South African mining industry in terms of fatal accident rates with 19 other countries during the early 1990's: South Africa had the sixth highest fatality rate.[4]

The commodity specific figures for deaths and reported (serious) injuries from 1993 to 1995 (see table 2) show no downward trend in fatalities for gold, platinum or 'other mines'. Serious injuries show no declining trend for diamond, platinum and 'other mines'.

Table 1: Fatal injuries in all mining operations for selected countries — early 1990's

Country	Year	No of fatalities	Fatalities per 1 000 employees, in ascending order
Belgium	1990	0	0
France	1990	1	0,05
United Kingdom	1990	11	0,16
Australia	1990	3	0,21
Canada	1991	26	0,24
USA	1991	95	0,25
Malaysia	1991	9	0,27
Germany	1989	9	0,28
Poland	1990	111	0,29
India	1991	265	0,37
Spain	1991	30	0,38
Czechoslovakia	1990	49	0,44
Zimbabwe	1991	40	0,73
South Africa	1991	726	1,05
Peru	1991	108	1,05
Yugoslavia	1991	178	1,23
Papua New Guinea	1991	20	2,04
Pakistan	1991	97	2,10
Turkey	1990	902	6,90
Mean Fatality Rate			**0,95**

[4] Source: ILO International Labour Conference *Report V(1) Safety and Health in Mines* (81st Session 1994).

Table 2: Fatal and non-fatal (serious) injuries for South African Mines, 1993–1995[5]

Commodity + year	Killed (sign indicates direction of change)	Injured (sign indicates direction of change)	Total (sign indicates direction of change)
Gold 1993	426	7368	7794
Gold 1994	372–	6858–	7203–
Gold 1995	414+	6249–	6663–
Coal 1993	90	279	369
Coal 1994	55–	239–	294–
Coal 1995	31–	237–	268–
Diamond 1993	20	99	119
Diamond 1994	18–	119+	137+
Diamond 1995	12–	130+	142+
Platinum 1993	29	492	521
Platinum 1994	24–	415–	439–
Platinum 1995	45+	833+	878+
Other mines 1994	17	257	274
Other mines 1995	30+	295+	325–
Total (1993–1995)	**1583**	**23870**	**25453**

When the accident data are further disaggregated, the available data from the gold mining industry show that the deeper the mine, the higher the fatality rate.[6] In 1993, 11 mines operated at depths greater than 2 100 m, producing 34,4% of total gold output. Most of the new mine projects are at depths below 2 000 m and prospecting suggests that ore bodies that might be mined in the future are at levels close to 3 000 m. The data on coal mines show a trend towards increasing fatal injury rates from methane explosions. In the 13-year period from 1955 to 1967, 3,3% of total colliery fatalities resulted from methane explosions: in the 13-year period from 1968-1980, this figure had been reduced to 2,8%, but in the next period 1981–1993, it had increased ten-fold to 21,3%.[7] Working at depth in gold mines, and the problem of methane explosions, are therefore the major problems for mine safety in the future, and will be major challenges for the new dispensation on health and safety.

[5] Sources: Leon Commission *Report* vol 1 table 6, and reply of the Minister of Mineral and Energy Affairs to parliamentary question 153 on 26 March 1996.

[6] The arithmetic means of the rockburst fatality rates for gold mines from 1989 to 1993 are 0,13 for shallow mines, 0,24 for deep mines, and 0,84 for ultra-deep mines, as defined in the CS Maclean mine safety competition. See Leon Commision *Report* vol 1 at 28.

[7] Leon Commission *Report* vol 1 at 32.

Occupational disease is as significant as traumatic injury in the history of the mining industry. However, it is much more difficult to characterize the effect of 85 years of the Mines and Works Act on occupational disease rates in the mining industry, because little reliable data exist on the prevalence or incidence of such diseases in the period 1911 to 1996. Throughout this period research institutions on occupational health and safety have regarded mineworkers as the passive objects of research, not its active subjects. This reflects the historical exclusion of mineworkers and their unions from any meaningful participation in setting research agendas and determining research methods. This has led to a lack of transparency in the collection of data, and a lack of peer review and public access to the data gathered. Mine occupational health services have been inadequate from the point of view of prevention of exposure of mineworkers, early detection and treatment of disease, and processing of compensation claims. A hint of the extent of underestimation of occupational disease amongst mineworkers has been provided in a recent research project to identify and record cases of occupational disease in ex-miners in the magisterial district of Libode situated in the Eastern Cape. 55% of ex-miners identified in this district were found on examination to have legally compensable occupational lung disease, and the director of Epidemiological Research Unit estimated that nearly all the national compensation fund of R80 m per year would be consumed if these individuals in the Libode district were to receive their legal entitlement under the Occupational Diseases in Mines and Works Act. This is a staggering burden of disease and if this district is anywhere near the mean for all labour supplying districts to the mining industry, the national implications are horrific. Other studies of respirable (and other) disease incidence suggest that this may well be the case.[8] Mining industry spokespersons such as Bobby Godsell (Anglo-American corporation director) have been quick to point out that some of the Libode cases are cases of TB *without* silicosis, and the contribution of work in mines to this disease burden can only be identified if the TB rate in comparable 'non labour-sending' districts is demonstrated as significantly lower. However, TB has long been recognized as an occupational disease in mining, and the industry can hardly attempt to rebut this presumption at such a late stage.[9] Godsell has also stated that

[8] One study amongst shaft sinkers and stopers showed that a man who performs this work for 8 000 shifts has a *one in three* chance of developing silicosis, a progressive, painful, disabling and ultimately fatal disease. Studies in the asbestos mining industry show that after 25 years of underground exposure, *a quarter of the workforce* will acquire occupational lung disease including lung cancer. After 40 years of exposure in South African coal mines, *more than half the workforce* would develop coal miners' pneumoconiosis. After only ten years of exposure to between *40 and 80% of rock drillers* in the gold mines will develop occupational hearing loss, a disabling and socially isolating and depressing injury.

[9] The Leon Commission documents that TB rates amongst mineworkers were 58/1 000 after 15 years of exposure to work in the industry. In 1992, *more than two-thirds* of 6 151 mineworkers certified by the Medical Bureau of Occupational Diseases with compensable lung disease had TB which they had acquired in their years working predominantly in the gold mining industry. This

South Africa may have to choose between requiring the industry to compensate workers for past injustices and protecting present jobs,[10] echoing the traditional refrain of the industry that it cannot be held responsible for the social and economic effects of its operations because health and safety are too expensive. The same Anglo-American Corporation argues that the South African government must drastically cut government expenditure,[11] presumably also expenditure on health and social services that might otherwise ease the burden of care for sick mineworkers that rests upon women and children in their communities.

There are also indications that the very high occupational disease prevalence amongst mineworkers is not yet something of the past. Several factors point to this conclusion:

- Rapid mechanization of stoping and underground transport of ore in coal and some metalliferous mines since the 1970's has greatly increased the throughput of minerals and therefore workers' exposure to respirable dust and other contaminants.
- The dramatic increase in the use of subcontracted labour underground in recent years has impacted negatively upon working conditions and practices, especially in the gold mining industry.
- The increasing use of piecework or production related bonus payment systems for production workers has resulted in corner-cutting with a consequential deterioration of working practices.
- The decline of the apartheid contract labour system on the mines in favour of permanent employment contracts has significantly increased the average length of service of mineworkers since the early 1980's, which could offset the beneficial effects of any improvements in control over the levels of dust and other contaminants and physical hazards.

is adequate confirmation of the presumption that TB is an occupational disease in mining. An expensive and time-consuming control study such as proposed by Godsell would only confirm what has been well understood for many years.

[10] 'New Study Shows High Rate of Illness among Ex-miners' *The Argus* 27 April 1996.

[11] 'There are enormous opportunities to privatise in this country. Privatisation gives the message to the world that you are serious about a free market economy, so it is an absolute must. Then proceeds from privatisation can be the basis for the RDP funding.' 'Anglo-American's Leslie Boyd (Deputy Chairman of Anglo-American Corporation and Chairman of Anglo-American Industrial Corporation) speaks bluntly on unions, wages, investment' *SA Labour Bulletin* vol 18 no 4 at 22–9. These views are also reflected in Business South Africa's recent policy statement tabled at NEDLAC — 'Growth for All — An Economic Strategy for South Africa': 'Reforms Required (2): Streamlining Government Spending and Revenues . . . total welfare spending should be pared, particularly where it is not directed towards very poor people . . . in some cases, government should provide for the delivery of services to the poor by linking privatisation to incentives to provide such services. But the ability of the new owners to restructure the companies they have acquired must not be impeded.' Business South Africa represents the top 54 South African companies and top ten international companies operating in South Africa — the mining industry, and Anglo-American in particular, was very influential in drafting 'Growth for All'. Those who wish for a confirmation of the fact that social services for the poor *cannot* be provided as part of a 'brisk privatisation' programme should look at Chile during and after the Pinochet dictatorship.

- The effects on occupational disease rates of the recent introduction of full calendar operations in underground production work in the gold mining industry remain to be seen. Because of the abolition of the weekly rest period, these work schedules could affect the ability of shift workers on intense schedules to recover from exposures to dust and other contaminants. Some of these schedules have introduced an *increase* in the annual hours worked by individual mineworkers,[12] which increases their rate of exposure and hence the risk of acquiring an occupational disease.

The Response Embodied in the MHSB

The context described in the previous section led to the adoption of the following key features in the MHSB:

- tripartite regulation and research process;
- increasing the possible scope and subject-matter of regulation;
- restructuring of the DMEA and its inspectorate:
  - increasing the independence and transparency of the inspectorate;
- increasing the powers of inspectors;
- workers participation at all levels of policy-making and enforcement:
  - obligation on the employer to negotiate in good faith with the representative (majority) union on the appointment of health and safety representatives, and the formation of health and safety committees at mine level;
  - rights of health and safety representatives to information and to take appropriate action;
  - health and safety committees at shaft and mine level;
  - national tripartite bodies (Mine Health and Safety Council, Mine Occupational Health Advisory Council, Safety in Mines Research and Advisory Council, Mining Qualifications Authority (MQA));
- an obligation upon employers to provide hazard awareness training for workers before they start employment, at regular intervals, when they change jobs on a mine, and before any major changes to the labour process;
- the legal right of mineworkers and their health and safety representatives to refuse dangerous work, pending the joint resolution of the issue at mine level by employer and worker representatives (and, if necessary, an inspector), the right of the

[12] For example, the FULCO schedule introduced in February this year at Anglo-American's no 3 and 4 shafts of Free State Saaiplaas Mine, and no 9 shaft of Freddies Mine in the Free State requires underground production workers to work 12 consecutive shifts, followed by only two shifts off. Averaged over one year, this increases average weekly hours of work from 48 (as in the previous 11-shift fortnight arrangement) to over 49 hours plus underground travelling time to and from the working place.

worker to be redeployed elsewhere, and the right of any substitute mineworker to be informed of the previous worker's refusal and the reasons for it;

- an obligation on employers to institute risk assessment:
  - regular detailed surveillance of the working environment and the health of employees in exposed jobs;
  - appropriate procedures to notify workers of their health status;
  - recourse to an independent medical inspector in disputes over medical fitness of any worker to perform a job;
- restructuring of research into health and safety via the inclusion of trade union representatives in SIMRAC, which will increase trade union influence over research topics and methods;
- harmonization of South African mining legislation with international standards — particularly the draft ILO Convention on Health and Safety in Mining.

These principles place the MHSB at the forefront of international progressive legislation on health and safety in mining operations. However, there remains a significant loophole through which employers may evade liability, namely the controversial provision in the bill regarding the onus of proof in prosecutions of offenders under the bill. In the form presented to parliament by the Minister of Mineral and Energy Affairs, the bill contained a clause (clause 94) in which the owner or manager of a mine was presumed to have committed an offence committed by an employee of the mine unless he or she could prove that:

- the employee acted (or omitted to act) without his or her knowledge or authorization;
- the employee acted (or omitted to act) outside the lawful or unlawful scope of the employee's job;
- he or she took all reasonable steps to prevent the employee's offence of commission or omission.

After representatives of mine owners announced their intention of testing this clause in the Constitutional Court, the Portfolio Committee on Mineral and Energy Affairs of the National Assembly scrapped it, thereby removing any rebuttable presumption of guilt on the part of mine owners and managers in the even of an offence being proved. Clause 94 was replaced by two new clauses, namely clauses 86(2) and 86(3) which were added after the existing clause 86. The combined effect of these two clauses is that:

- any person who, by a negligent act or omission endangers the health or safety of a person at a mine or causes serious injury to a person at a mine commits an offence (as in common law, the state would have to prove such negligence);
- the owner or manager must be convicted of committing an offence if the state proves that:

  - the health or safety of a person at the mine was endangered or that a person was seriously injured at the mine; and
  - the *working environment* at the mine was not safe and was not without risk to the health of employees; and
  - the danger or injury was due, either wholly or partly, to the condition of the working environment at the mine;
- if the state proves its case as above, it is a *defence* for the owner or manager to prove that he or she did what was *reasonably practicable* (defined in the Act) to provide and maintain a *working environment* at the mine that was safe and without risk to the health of employees.

It is not clear what effect this will have on the effectiveness of prosecutions. Whilst the onus remains on the state to establish a case in the first instance, the use of the term 'working environment' will enable prosecutors to look quite broadly at the causes of injuries and ill health in mining in doing so. However, the owner or manager only has to prove that 'reasonably practicable' steps were taken to prevent the occurrence in question. 'Reasonable practicability' is defined in the draft bill as practicable with regard to:

- the severity and scope of the hazard or risk concerned;
- the state of knowledge reasonably available concerning that hazard or risk and or any means of removing or mitigating it;
- the availability and suitability of means to remove or mitigate that hazard or risk;
- the costs and the benefits of removing or mitigating that hazard or risk.

This gives employers a *wide range of possibilities* for rebutting any presumption of liability. In particular, it introduces the element of cost-benefit analysis, which has been roundly criticized internationally on the grounds that the costs (financial) are not comparable to the benefits (enjoyment of maximum technically possible freedom from risk), and therefore cannot be compared. All too often, cost-benefit analysis results in the setting of standards at the lowest *financially* feasible and therefore *acceptable* death and disease rate (the nuclear industry has pioneered this type of approach in setting international radiation standards!).

A further and related problem is that courts may not be in a position to challenge industry estimations of the financial costs of health and safety measures, because of insufficient information and economic uncertainty. Therefore we propose that where a court finds that the only defence is that more effective health and safety measures were not reasonably practicable, it should have the power to order:

- *either* that a prior instruction of an inspector regarding the deficiency in the working environment in question be permanently confirmed (as under clauses 55 to 59); or

- that a particular working practice or set of working practices (as under clause 75) be prohibited or restricted de novo; or
- that the mine sponsors research (through SIMRAC) to find the most cost-effective method of removing or mitigating the risk concerned, and thereafter report to the court (within a specified and reasonable time) on the proposed method and cost. After this time has elapsed, the court, on studying the report and receiving any further information necessary (possibly from the inspectorate, or other expert witnesses), would then have the power to order the owner or manager to implement specified measures within a reasonable and specified time. The time scale could be a number of years, depending on factors such as the costs involved and the financial position of both the industry as a whole and the particular mining company and/or operation. If the state is able to prove that the mine owner or manager failed to implement the order, then the defendant could be automatically convicted of the original offence.[13]

If the MHSB's definition of 'reasonable practicability' permits an easy defence against the state's case it will seriously reduce the efficacy of prosecutions in enforcing the manager's general duty to provide a safe and healthy working environment. It would also encourage the conviction and punishment of the persons whose nominal responsibilities are more immediate and specific, or inherent in their job description, as has been the case in the past.

Future Tasks and Intersectoral Collaboration

Rationalizing legislation on compensation for occupational disease acquired through work on a mine

There is an urgent need to review the Occupational Diseases in Mines and Works Act (ODMWA) of 1973, administered by the Department of Health. This Act provides mineworkers with less compensation for occupational disease than is provided to their fellow-workers in the manufacturing industry by the Compensation for Occupational Injury and Disease Act of 1994. The need for a review was identified in both the African National Congress Health Plan and the RDP. This is the inevitable result of fragmentation of compensation legislation, jurisdiction and service provision between two government departments, which have not cooperated in the past. Changes to the ODMWA

[13] The approach of ordering changes in working environment was employed by the regulatory authority in the hearings leading to the adoption of the USA Lead Standard issued by the Occupational Health and Safety Administration in that country. The OSHA heard evidence of the costs to the industry of reducing the lead exposure of employees, and on the basis of this imposed a standard and a time schedule for compliance on the entire industry, taking into account the costs of various different engineering strategies to reduce current emissions to the standard.

will also affect decisions to be taken about the future of the Medical Bureau for Occupational Diseases (MBOD) whose past function of issuing certificates of fitness to mineworkers has been appropriated by the Department of Mineral and Energy Affairs (DMEA) under the new Act. The MBOD has been moved from the DMEA to the Health Department, and now there is a move to move it back to the DMEA. These moves indicate an uncertainty and lack of long-term vision of the role of the MBOD. Intersectoral collaboration is needed to resolve the ultimate role of the bureau, and to harmonize its activities with those of the new office of the medical inspector attached to the Mineral and Energy Affairs Inspectorate, which has the function of providing an independent adjudicator in disputes over fitness for work. Whatever finally happens administratively and structurally to the various agencies involved in compensation, intersectoral collaboration between the Departments of Health and Mineral and Energy Affairs will be essential.

Ensuring access for mineworkers to occupational health services in the public sector

As well as relinquishing its function of issuing certificates of medical fitness to work in the industry, the MBOD has closed down a number of its regional subbureaux as the responsibility to provide medical surveillance of mineworkers has been devolved almost entirely from the state to the employer. Furthermore, a recent report of the Chief Directorate of Occupational Health in the Department of Health describes the almost total lack of provincial state occupational health services with the exception of Gauteng. The Health Department has set itself the goal of developing provincially based occupational health units focusing on the recognition of occupational disease including that amongst unemployed workers and workers in poorly regulated or unorganized sectors, especially unemployed ex-mineworkers living in rural areas. The achievement of such a task requires intersectoral collaboration between the Departments of Health, Labour and Mineral and Energy Affairs at both national and provincial levels.

The approach of the MHSA to occupational health surveillance programmes in the mining industry has been to prescribe that mine managers must establish and maintain a system of medical surveillance of employees exposed to health hazards,[14] and that this must be carried out by an occupational medical practitioner and, insofar as it is necessary, other practitioners holding a qualification in occupational medicine recognized by the (Interim) National Medical and Dental Council, or the South African (Interim) Nursing Council. This is likely to lead to mine health surveillance programmes being provided largely by occupational nurses, which is in line with the importance that the Department of

[14] Clause 13(1) of the bill as it stands at the date of writing.

Health has ascribed to the nursing profession as the main dynamo of the future national health service in terms of human resources. However, the skills of this group will have to be developed so as to enable them to provide an effective occupational health surveillance system for mines. At the same time links between these vital health workers and the state provincial health services must be nurtured to make sure that technical and ethical standards are upheld. These links must be developed in terms of training, policy development, development of standards, and back-up services.

The issue of mine housing

The Leon Commission *Report* noted that the number of men housed in single-sex hostel rooms in the mining industry varied from eight per room in the better hostels to 20 per room in hostels built before 1940. Single-sex hostels are still being built and relatively new mines still house 16 workers in a room. The commission warned that overcrowding, particularly in bedrooms, leads to an increased risk of the spread of TB. It therefore recommended that, for mines with a remaining life of ten years or more, the industry must reduce the number of men to a room to a maximum of eight per room within five years. It also gave the opinion that 'it would not be unreasonable to suggest that consideration be given to the provision of married accommodation to be made available on new mines for 50% of the workforce'[15] (for psychosocial reasons, as a measure to control the spread of HIV infection and the high level of physical assault in hostel premises).

As it reads at the moment, the MHSB empowers the Minister of Mineral and Energy Affairs to *regulate standards of housing and nutrition of employees who are accommodated at a mine* (clause 99(1)*(p)*). In a document entitled *Comments by Mining Industry Employers on the Mine, Health and Safety Bill* from the Chamber of Mines of SA, submitted to the portfolio committee on Mineral and Energy Affairs of the National Assembly, the chamber puts forward its arguments against clause 99(1)*(p)* of the draft MHSB. The chamber cites the Leon Commission recommendation that the question of housing and accommodation for workers and their families at mines should be investigated 'in another forum' (ie not through regulation by the minister under the MHSB). However, it concedes that the Leon Commission did recommend that revision of the regulations should include minimum standards for housing and feeding workers. Moreover, the commission does not argue against regulation by the minister as a means of dealing with the issue — it merely recommends that a *tripartite structure be established* between the state, the mining industry and representatives of employers to investigate it. In the light of the tripartite and intersectoral nature of the process of regulation

[15] Leon Commission *Report* vol 1 ch 4.

envisaged under the MHSB, ministerial regulation on the issue of housing and feeding workers would be an obvious way to ensure that the Leon Commission's recommendation is carried out. However, the chamber makes it clear that it is not in favour of tripartite regulation of these matters, but rather in favour of bipartite regulation via collective bargaining agreements which excludes all cognate state departments.[16] Therefore the issue for the chamber is perhaps not so much *ministerial* regulation, but *tripartite regulation* of mine housing. In response to the chamber's concern, we would cite the following factors in support of the tripartite approach:

- the central importance of housing provision to the RDP;
- the failure of mining employers to address the poor state of mineworkers' housing since the introduction of the single-sex migrant workers' hostel;
- the need to establish national minimum standards for housing on all mines. This requires pooling of resources amongst different mining companies in the same mining house, or possibly pooling resources between different mining houses to solve the housing problem on the mines. In an industry that is as highly economically centralized as the South African mining industry, such resources cannot be allocated by collective bargaining in any one bargaining unit or 'business unit' or 'profit centre';
- the multilateral nature of national housing policy formation since the inception of the government of national unity. This approach is outlined in the RDP;
- the sheer scale of mine housing.

The remaining arguments of the chamber seem to relate to the specific suggestions for minimum standards made by the Leon Commission report. Regarding the link between hostel accommodation and health, the chamber states:

> 'No currently valid scientific link has been established between hostel accommodation and occupational health . . . a narrow prescriptive limit of 8 people per room lacks any observable scientific basis; in the absence of contextualisation in terms of available floor space, cubic air space and ventilation factors it was clear that such an undefined, prescriptive recommendation could not be justified. Until it had been shown that current hostel accommodation arrangements had a significant effect on occupational health, there were no grounds for the Commission's recommendations in respect of hostel accommodation and family housing.'[17]

This paragraph exhibits an inability to distinguish between what is scientifically demonstrable and what is morally defensible. This inability has been the hallmark of the guardians of the single-sex hostel system in the mining industry since its beginnings. It is to be hoped that this

[16] Chamber of Mines *Comments by Mining Industry Employers on the Mine Health and Safety Bill* (no author or date given) at 23.

[17] Chamber of Mines op cit.

attitude will not continue to prevail under the new dispensation implied in the MHSB.

One aspect of mine housing that has not been brought into public scrutiny so far is the relationship between shiftwork and mine housing conditions. Mineworkers are shift workers, working rotating night and day shifts, for example, on the 11-day fortnight schedule which has been the norm in the industry since the late 1970's. The implications of having to share a single-sex hostel room with 20 mineworkers, half of whom are on the night shift and half on the day shift, have to be considered. The problem may well be exacerbated when mineworkers are put on to a FULCO schedule involving working weekends, sometimes in a schedule where they work 12 consecutive shifts and take two or three shifts off. How does hostel accommodation fit with sleep under these circumstances? More information is needed on the relationship between shiftwork schedules and accommodation in single-sex hostels.

We strongly support the recommendations of the Leon Commission report that the whole question of housing and feeding of mineworkers should be investigated in a tripartite forum, and would further argue that ministerial regulation under the MHSB would be an entirely appropriate forum, so long as it fosters intersectoral cooperation between the Departments of Labour, Health, Mineral and Energy Affairs and Housing, as well as employers and trade unions in the industry.

Research on occupational health and safety in the mining industry

In an important keynote article about his perceptions of future research needs in deep-level mining in the gold industry, the Director-General of the Chamber of Mines Research Organisation (COMRO), Mr H Wagner, wrote as follows:

'I have come to the following conclusions:

- The continuing pressure for higher wages and improved conditions of employment on the mines can be met in the longer term only by an increase in labour productivities. The substantial improvements in wages paid to the largely unskilled work force on the gold mines was made possible only by the increase in the price of gold in rand terms, and were not the result of improved labour productivity.
- *Safety and environmental conditions on deep-level mines can be improved in the longer term only if the production per metre of stope face, that is the rate of advance, is increased.*
- Improvements in labour productivity and in the rate of face advance are restricted largely by the technology employed in deep-level stopes. Significant improvements in deep-level mining efficiencies can result only from the mechanisation of stoping operations.
- The harsh environmental conditions in deep-level gold mines and the confined working space in stopes severely restrict the application of mining technology developed elsewhere, and require the development of special stoping equipment to suit local conditions.
- The successful introduction of new technology in deep-level mines will depend

largely on the availability of skilled workers. The shortage of artisans and other skilled workers in the gold-mining industry is of great concern. Novel ways of solving this pressing problem will have to be investigated.

- The role of the engineering and service departments on deep-level mines will increase as a result of the change from labour-intensive to more capital-intensive methods of mining. Due consideration will have to be given to this shift in emphasis to ensure the full participation of these departments in management decisions.
- The cost thinking as it exists at present on most deep-level mines will have to change to account for the envisaged change from labour-intensive methods of mining.
- The introduction of higher-level mining technology in deep-level mines has the potential for considerable job advancement and improved conditions of employment for all workers.'[18]

With regard to the question of improved health and safety in the deep-level gold mining industry, the essence of this staement is that long-run improvements in the working environment in deep-level gold mining is *not really possible for the lower grades of underground production workers, and so improvements will have to wait until technological research into mining methods raises the rate of face advance, and in the process renders unskilled workers redundant. In the long term the only way to reduce exposure to risk for deep-level underground mineworkers in grades 1-8 is to replace them with machines operated by higher skilled workers.*

This statements has certain implications for research strategy into health and safety in the gold mining industry, by far the most dangerous subsector of mining from the point of view of death and traumatic injury.[19] First of all, it suggests a fatalism about research into health and safety per se for deep-level production workers. Only engineering controls (substitution of new technology) are said to be capable of improving the situation, so research must exclusively focus on the development of new labour saving machines. This ignores factors such as:

- changes in power relations underground;
- changes in the methods of payment (piecework bonuses or measured daywork or straight-time rates);
- harnessing of mineworkers' own systems ('pit sense') for recognition of danger;[20]

[18] H Wagner (Director-General, Research Organisation, Chamber of Mines of SA) 'The Challenge of Deep-level Mining in South Africa' presidential address to the SA Institute of Mining and Metallurgy *J S Afr Inst Min Metall* vol 86 no 9 at 377–92 (Author's emphasis).

[19] It is impossible to characterize the relative magnitude of the gold mining industry's contribution to the burden of the few recognized occupational diseases in the mining industry as a whole, let alone the officially unrecognized cases of work related ill health. 'The major difficulty faced by the Commission and shared by those who gave written or oral evidence is the absence of data which can be used to define occupational risk by class of mine or mineral and by location of workplace within a particular mine.' See Leon Commission *Report* vol 1 para 4.8.1. This historic failure of research strategy renders it impossible to intervene effectively to control occupational disease in the mining industry.

[20] See J P Leger's fascinating thesis *'Talking Rocks' — An Investigation of the Pit Sense of Rockfall Accidents Amongst Underground Gold Miners* Wits University PhD thesis Johannesburg 1992.

- changes to the shiftwork systems to reduce fatigue in underground workers;
- changes to working practices and safety standards underground around existing technology;
- improvements in maintenance procedures;
- improvements in health and safety training methods;
- improvements in coordination of functions between seismological, health and safety, and training departments in mines;
- improvements in mineworkers' general health status — eg mine housing.

These are just some of the possible areas where useful research topics could have been developed. Judging by the bias of its research programmes in the past towards production related and cost-saving hard engineering topics, it seems that the Chamber of Mines regarded such research issues as being useless in the long run. Even after the transfer of the COMRO to the CSIR (CSIR-Mintek) and the creation of the Safety in Mines Research Advisory Committee as a statutory body[21] in 1992, the vast majority of projects have been engineering based ('hard science') and continue to be carried out by the rump of the old COMRO in the CSIR. New topics and a new interdisciplinary and cooperative research strategy has not emerged.

The second point to make about the COMRO Director-General's 1986 statement is that it suggests an almost naïve faith that new technology will always act in the direction of improving the working environment, and therefore reducing the rate of death, injury and disease in deep-level mining. However, international research in occupational health and safety has shown that changes in technology merely alter the types of injuries and forms of ill health that occur, rather than reducing or eliminating them. Therefore, health and safety research programmes will be necessary to minimize problems at *any* level of technology to ensure a reduction in risk.

SIMRAC was established as a technical committee funded by a levy of mining companies according to a safety risk indicator specific to that company, and determined by the Director-General of Mining and Energy Affairs. In addition, any fines levied for non-payment of SIMRAC levies were to be added to the fund. The Chamber of Mines's vision of health and safety research entirely dominated the creation of SIMRAC. Health was omitted entirely from its brief. Nine out of 14 members of the committee were from mining companies, and one from the chamber. The other four were from the DMEA, including the chairperson, the GME. This guaranteed that there would be no fundamental change in research strategy, which would continue to be dominated by the employers in the industry, as in the past. Since the

[21] ch 35 of the Mines and Works Act; reg 35.1–35.4.

formation of SIMRAC, the NUM has had three advisers sitting on the committee. It also participates in the labour caucus of the committee, which includes the smaller unions in the mining industry. However, this has failed to make the impact on research strategy and scope envisaged in the criticisms and recommendations of the Leon Commission report.[22] The Chamber of Mines is currently studying a proposal from the NUM to solve this problem by implementing the recommendation of the Leon Commission that the structure of SIMRAC should be altered to make it a fully tripartite institution under the MHSB, with provision for technical advisers.

As it stands at the moment the MHSB envisages that the role and function of SIMRAC will be as follows:[23]

- provide advice to the tripartite Mines Health and Safety Committee on:
  - the criteria for determining the funding of health and safety research;
  - the need for research into health and safety at mines;
  - research priorities of projects;
  - costs of research;
  - assessment of research;
  - ratification of research;
  - execution of research;
  - communication and publication of research;
  - management of the cost of the overall programme;
- prepare an annual programme for research for the MHSC to consider. The programme must include:
  - a review of health and safety performance in the different mining sectors;
  - an evaluation of the research proposals made by the MHSC or a committee of the MHSC;
  - the focus of health and safety research and priorities for the different sectors of mining;
  - an estimate of the cost of the programme.

This allows representatives of mining management to retain almost total power over the shape of research in the future on health and safety. Research paradigms, methods and topics which challenge key managerial strategies in the industry will not be accepted or their conclusions will be ignored.[24] SIMRAC even has the power to review suggestions for research from the tripartite MHSC, which will greatly reduce the possibility of challenging projects that have been accepted through that

[22] See Leon Commission *Report* vol 1 ch 7 'Research Policy and Management'.

[23] MHSA cl 44(3) and (4) as amended by the portfolio committee on MEA of the assembly.

[24] From 1991 to 92 onwards, the Chamber of Mines carried out a relentless publicity campaign to assert that the abolition of the legal prohibition of underground production work on Sundays was vital to secure the survival of the gold mining industry in particular. It was to pave the way for the widespread introduction of 'full calendar operations' or 'continuous operations' as the standard working schedule in the gold mining industry, and can be seen as one of the major

route. The bill as it stands must be amended to restructure SIMRAC as a democratic research management body. Further amendments are needed to require the director-general to report annually to the MHSC and the Minister of Finance on the exact basis and method of the risk rating for the SIMRAC levies, the levy for each individual mine, the names of companies that default on their levy, the amounts of the default, and the fines levied by mine.

However, SIMRAC also needs to be expanded to include health issues explicitly in its brief and the question of the status and home of the Epidemiology Research Unit (ERU) under the Department of Health must be resolved. Perhaps routine data collection and dissemination (health information system) on occupational health matters in the industry could be incorporated into a permanent staff under the Department of Mineral and Energy Affairs bringing the expertise of the ERU into play, and that proposals for specific epidemiological research projects are routed through the normal SIMRAC channels.

Conclusion — Budgetary Considerations for Implementation of the Key Principles of the MHSB

In the proposed budgetary allocation of the Department of Mineral and Energy Affairs for 1996–7, the Atomic Energy Commission will receive R231 000 000, and Nuclear Safety will receive R317 585 000. In contract, regulation of mining and work activities (programme 2) receives R31 499 000; mine safety (programme 4) receives R9 870 000. Such a skewed relationship between financial and human resources is indefensible, and may prevent the MHSB from having any real effect on health and safety in the mining industry. If the far-reaching provisions of the MHSB are to be successfully implemented, the proposed budget needs to be revisited. The proposed budget is also very vague about the various elements envisaged in the proposed six programmes, and the division of the funds between these different elements. The budget proposal needs to be much more detailed in this regard.

strategies for restructuring the industry that the chamber has put forward this decade. The chamber is still pursuing this goal, and is implementing FULCO schedules in marginal gold mines as the sole alternative to retrenchment or closure of embattled mines. In 1993, SIMRAC decided to commission research into night and shift work on a continuous basis, by which time its campaign on Sunday working was under full steam. The research was duly given to CSIR-Mintek, as most projects still are. The researcher concerned, Dr A J Kielblock in the Industrial Hygiene Department proposed to assess empirically the impact of shift work and continuous working on a selection of mineworkers, but this proposal was rejected by the management representatives on SIMRAC, so that the only research possible was an international literature search. Even so, the 1995 research report concluded that 'even a cursory analysis of schedules (for continuous operations in the mining industry) presently in use on local mines is indicative of the extent to which elementary guidelines have been ignored'. This report was similarly ignored in subsequent FULCO schedules such as that at Freegold Mine in the OFS. This cavalier treatment of the issues involved in continuous shift working in deep-level mining would not happen if SIMRAC were a fully tripartite institution under the MHSB.