QUEENSLAND*

THE MOURA INQUIRY: A STING IN THE TAIL

INTRODUCTION

The report of the official inquiry into the Moura disaster of August 1994, and a refreshingly frank coroner's report, should produce significant changes in the administrations of the State's minerals and energy laws.

On Sunday 7 August 1994 an explosion at Moura No 2 underground coal mine caused the deaths of 11 miners. The warden's report upon the incident was released in Rockhampton in January, soon after the last Queensland section went to press.

The inquiry was conducted under the *Coal Mining Act* 1925 (Qld) by Mining Warden Windridge, assisted by four assessors including Professor Roxborough of the School of Mines, University of New South Wales. Hearings commenced on 18 October 1994 and concluded on 6 April 1995. Evidence was received from 66 witnesses.

The Moura mine is situated in central Queensland's Bowen Basin, about 450 km north-west of Brisbane. Underground and open-cut operations have been conducted in the area since 1960. In 1975 13 lives were lost in an explosion at the Kianga mine and 12 miners died in an accident at the Moura No 4 mine in July 1986. Moura No 2 was opened in 1970.

The first explosion occurred on Sunday 7 August 1994, and a second, much more violent eruption came two days later. Ten men escaped, but unfortunately 11 of their workmates were still underground when, after the second explosion, hopes of their survival were abandoned and the mine was sealed.

The inquiry found that the first event was caused by "a failure to acknowledge, and effectively treat, a heating of coal which, in turn, ignited methane gas". The cause of the second catastrophe could not be determined. Excessive loose coal was allowed to accumulate in the tunnels and it is probable that fallen rock, in covering it, prevented efficient ventilation. Ventilation was by means of two parallel centrifugal exhaust fans at the top of a 158 m deep vertical shaft. The concentration of carbon monoxide, oxygen, methane and carbon dioxide was monitored by a gas analysis system but the instruments were not adequately supported by "a dedicated and regularly updated plan" to check air quality. The coal was drained of gas for about two years before extraction. However, there was expert evidence that this increased the risk of spontaneous combustion by allowing oxygen to permeate the mineral and to promote overheating when water afterwards reached the coal. On this aspect the report concludes:

> "It must now be obvious that reliance on . . . an incubation period is not an adequate defence in the face of the many other factors likely to influence . . . a heating . . . At Moura because of the continual change in panel design and working methods virtually nothing was constant."

WHY WAS THE HEATING MISSED?

Several inter-connected reasons are given:

- mine managers did not know enough about spontaneous combustion;
- what they did know was not properly applied;

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- available safety devices were used improperly or not at all;
- reporting systems between men and management were sub-standard; and
- certain information which was available did not evoke adequate managerial responses.

Furthermore, publications produced after the 1975 Kianga disaster had not been updated and were no longer readily accessible. Valuable material distributed by the Minerals and Energy Department after the 1986 explosion at Moura No 4 was not properly appreciated by those in charge of Moura No 2. Seminars on coalmine safety which were proposed in 1986-1987 never came to pass. Local legend had it that "a slow, steady rise in CO production could not constitute a problem and that an exponential rise was required to indicate a heating".

In 1986 the Department had issued warnings that even sophisticated gas-analysis equipment is not infallible, and that care should be taken to record human perceptions of faint and fleeting smells of "tar" and the like. In this case no action was taken in response to a report of a "strong benzene-type smell" in late June 1994, "despite that fact that it must have been alarming to anybody" capable of appreciating it. The regular ventilation officer was absent for three weeks just before the explosions. In the meantime various people took instrument readings of CO traces but some of them "did not appear to know why the readings were being taken". Internal communications were "abysmal" and "any original focus the exercise had was quickly lost. People . . . simply [went] through the motions . . . without much regard to purpose".

On 5 August, just two days before the first explosion, two workmen reported a "strong tar smell", but no further inspection of that part of the mine was made. About the same time one of the miners who died jotted in his diary: "Concerns over heating". At the eleventh hour a routine sealing-off of the suspect section (or panel) was advanced a few days as a precautionary measure. Early on the fatal Sunday (7 August 1994) it was noted that gases were building up in the sealed panel, but still no managerial concern was evident. During that afternoon and evening successive deputies came off and on duty without comparing notes — "a lost opportunity for communication regarding the state of the mine". The inquiry notes that several of the tell-tale observations were made on a Friday, when they were apparently overcome by the weekend spirit.

> "There appeared to be no one who was a single and responsible recipient of a series of apparently disconnected but vital pieces of information. No one was put in . . . the whole picture."

It was decided to allow those who chose to go on duty to do so, but not to "force" anyone to do so. So far as the inquiry could ascertain, management relied on nothing better than "quite a good grapevine" to keep workers informed of the state of the mine. An available gas chromatograph was not used because it was kept especially "for emergencies". (The idea seems to be that lifeboats should stay firmly tethered until the mother of all icebergs hits the ship!) In the inquiry's opinion there is no certainty that it would have avoided the disaster, but in combination with a proper appreciation of other information it may well have done so.

> "It is the opinion of the inquiry that events at Moura . . . as to the state of knowledge of the night shift on 7 August . . . represent a passage of management neglect and non-decision which must never be repeated in the coal mining industry. Mine workers place their trust in management and have the right to expect . . . responsible decisions in respect to their safety.

> It is regrettable that the air of caution . . . exhibited . . . to bring forwards the sealing of 512 Panel did not extend to the general safety and welfare of the work force."

The first explosion, at about 11.30 pm on the Sunday, cut the supply of electricity to the exhaust fans and the methane contamination level rose markedly. From that time until the second explosion (about 36 hours later) a very high concentration of carbon monoxide in several parts of the mine prevented rescue teams from going down and forced mine employees to stay away from openings to the mine.

THE SECOND EXPLOSION

A second and more violent explosion occurred about midday on 9 August 1994. The ducting linking the mine fan to the shaft was destroyed. Carbon monoxide levels near the surface facilities exceeded 400 ppm and immediate evacuation of the area was imperative. Gas analysis equipment was taken several kilometres away. The mine was sealed by pushing spoil material over the edge of the highwall into the entry tunnel. It is not known whether the miners who perished survived the initial blast. The experts were inclined to think that they did, but eventually heat would have made the wearing of respiratory gear intolerable, and if it were removed, high levels of carbon monoxide would have caused asphyxiation.

THE FUTURE

The inquiry appears to be resigned to contemporary bureaucracies from which personnel are forever absent "on courses" or some other form of "training" while colleagues with a sense of humour furtively pin up posters extolling "Meetings — the Practical Alternative to Work":

> "[T]here will no doubt be an early spate of training, the conduct of seminars and symposia . . . [T]hese measures will be effective for somewhere around a decade with fundamental problems beginning to re-emerge somewhat earlier."

But nil desperandum. The inquiry makes several recommendations for better governance of underground mines, although it is surprising that they have to be made in 1996.

Spontaneous Combustion Management

The report recommends that all coalmines should be required to establish a management plan to the satisfaction of the Chief Inspector. Gas monitoring should be supplemented by personal observations and a system of reporting in which the chain of command is perfectly clear. Regular internal and external audits of the system are essential.

Mine-Safety Management Plans

As well as spontaneous combustion, other "risk areas" to be considered in any plans for mine-safety management include:

- training;
- communications;
- ventilation;

- emergency evacuation;
- gas management;
- sealing;
- mine-surface facilities;
- methane drainage; and
- strata control.

There must be "action plans" to deal with these hazards as they arise. Some of these risk areas will be considered in more detail below.

Training

"It is clear", declares the report, "that many personnel at the Moura No 2 Mine from the superintendent down were inadequately trained in important aspects of their duties."

It is imperative that training in spontaneous combustion and safety devices is kept up-to-date.

Certificates of competency should no longer be issued to mine managers and others for life, but should be renewable every three to five years. Other professional people, such as doctors and lawyers who were drafted into regular "continuing education" courses several years ago may be surprised to hear that the good old days still exist in the mining industry, in some parts of Australia at least.

Communications

There were many weaknesses in communication at the Moura No 2 Mine, including lack of contact between deputies on weekend shifts, failures by people who attended seminars to disseminate their newly-acquired knowledge, and the absence of a proper system to collate and analyse information contained in "on-the-spot" reports: "There were numerous reports of smells and hazes from 17 June to 6 August 1994 as well as increasing levels of CO." Miners were sent underground on 7 August without due warning.

Ventilation

Moura No 2 did have a ventilation officer but he was merely a powerless record-keeper. The position should be given statutory recognition, with powers analogous to those of mine managers.

Emergency Evacuation

Moura No 2 had no set procedure for withdrawing workers from the mine if and when danger arose. Statutory guidelines for this purpose are needed, "subject to agreement amongst all parties with a valid interest at any particular mine".

The inquiry recommends that a working party be set up to devise better escape facilities for miners who are "subject to disorientation or severely impaired visibility". "Refuge chambers" — self-contained life support chambers at various points in a mine — merit further consideration. Another suggestion is that underground mines be equipped with machines to bore large diameter holes from the surface to miners trapped below.

Gas Management

There should be clearly defined responsibilities for gas-monitoring protocols, including setting alarm levels for recording and reporting readings and for taking remedial action.

There is also an urgent need for government to provide equipment to render the atmosphere inert in dangerous sections of mines to avoid "total loss". There is still no such equipment in Queensland. Recommendations made after the 1986 explosion at Moura have not been followed up.

Sealing — Designs and Procedures

The sealing of an area in a "gassy mine" should never be treated as a routine event. Moura No 2 did not comply with legislation which requires seals to withstand pressures of 345 kPa and to be capable of construction within three hours. In future, sealing procedures should be subject to the approval of the Chief Inspector of Mines acting on advice from the mine manager.

Mine-Surface Facilities

Underground mines should be required to prepare a surface-area plan showing entry tunnels, ventilation fans, access roads and other infrastructure, and to lodge copies of same at the local police station and with the Chief Inspector of Mines. Boreholes which could be used to monitor gases should also be shown. Both new and existing operations should be directed to install an airlock facility in at least one of their mine intakes.

Research into Spontaneous Combustion

There is a great deal of information available on spontaneous combustion but unfortunately is not widely known among mine operators. At present it is diffused in several languages and in different parts of the world. The inquiry recommends that research funds be made available for an early "state-of-the-art report" on spontaneous combustion. At the same time "priority areas" for Australian research should be identified.

Literature and Other Support

The inquiry regrets that there is no longer a high quality Australian journal devoted to techniques and safety measures in the coalmining industry. It believes that "Australia's status as an advanced nation in the world of coal mining" warrants the early re-establishment of suitable literature, as well as specialised safety courses. Is federal-State co-operation called for?

THE CORONIAL REPORT[1]

Apart from the inquiry under the *Coal Mining Act*, the warden, this time without technical assessors, sits as coroner. As a sole reporter he may speak more plainly and directly. Anyone who might be inclined to take a more restrictive view of the coroner's role in dealing with a mining disaster is referred to modern

1. Coroner's Report, Rockhampton, 17 January 1996, 17 pages.

authorities which encourage coroners to have due regard to the "legitimate concerns of relatives, [and] the concern of the public in the proper administration of institutions" such as Departments of Minerals and Energy.[2]

His Worship proceeded:

> "The deaths of eleven men at the Moura No 2 Underground Mine is the third underground disaster at Moura in 20 years, and as such the public interest must be invoked, and the concern of relatives must be answered."

Statutory responsibility for the vast coalmining industry in the Bowen Basin is shared by the Rockhampton and Mackay branches of the Mines Inspectorate. Moura No 2 is in the Rockhampton District and:

> "The evidence indicates that for a number of years the staffing levels of the Rockhampton Office were lamentably inadequate. [The Chief Inspector there] raised . . . staffing levels and the work load . . . a number of times with his senior officers . . . only to be rebuffed with what I consider to be spurious excuses. Some positions were left unfilled for . . . years. . . . [O]ne is left with the impression that as far as head office was concerned, safety, health and enforcement of the regulations were secondary to budget considerations . . . [The then Director-General] went into that meeting [with the Rockhampton head of staff] with a predetermined opinion and a lack of understanding . . . It is noted that [the Director-General] had none of the relevant practical experience or qualifications which would have allowed him to make a personal definitive assessment of any particular situation relating to health or safety of miners."

As warden and coroner Mr Windridge regrets that "due to the actions of others and low morale, valuable qualified . . . staff left to find alternate employment [because] a level of administration comprised of persons not necessarily qualified or with industry experience was created within district offices". While politicians and others trumpeted new mining developments in the State there was "no counter announcement that the resources of the Inspectorate [would] be similarly increased to monitor the health and safety of miners".

While the Inspectorate should be strengthened and supported it should be relieved of some traditional duties. In particular, inspectors of mines should not be expected to prepare statements of witnesses when accidents occur: "A prosecution could 'fall through the cracks' due to unsatisfactory investigatory methods." The task should be transferred to the police.

The coroner's report robustly concludes:

> "Governments which derive large benefits from [coal mining] have a duty to ensure that [it] is carried out in as safe a manner as possible . . . With the right to regulate comes the responsibility to ensure that the workplace is made as safe as possible for those men and women who work in the mines . . . year in and year out. Governments have no moral right to walk away when a disaster happens . . . They are, by association and legislation, clearly involved. . .
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> It goes without saying that all [the] witnesses . . . will receive protection from the court if necessary. Any attempt to 'shoot the messenger' . . . will cause the court to consider the remedy it might take under the wide powers that are available to it. It is not the function of the Warden's Court to protect the Minister or to act as a rubber stamp for the Department of Minerals and Energy . . .
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> No doubt there now be a plethora of steering committees, advisory panels and consulting groups. . . It is with some satisfaction that I, as warden, will be in a position to monitor the recommendations. In particular, new applicants for coalmining leases will be required to address the recommendations contained in the Moura Report . . . I would urge the Minister

2. Cf *Bilbao v Farquhar* [1974] 1 NSWLR 377 at 387 per Bowen JA.

to take action to implement the recommendations as soon as possible, keeping reviews and restructuring to a minimum, and dealing with the real issues.

Those miners who have died on the Moura Lease in the last 20 years deserve . . . nothing less."

LATE REPORTS

As this item went to press we received two recent and interesting decisions from the Warden's Court. The first deals with defective marking-out — a Queensland version of Western Australia's more celebrated *Hunter Resources v Melville*.[3] The other suggests a more liberal approach to objectors' costs than in years and cases past. In particular it deals with a situation in which the warden advised against the granting of a lease for reasons raised by the objector, while the Minister rejected the lease application on other grounds. These decisions will be reviewed in the next issue of this Bulletin.

3. (1988) 62 ALJR 88.