JK 0549/95

VAAL REEFS DISASTER
10 MAY 1995

REPORT IN TERMS OF SECTION
28(4)(A) OF THE MINERALS ACT, 1991
(ACT NO. 50 OF 1991)

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1. INTRODUCTION

On 10 May 1995 at about 20:12 a 30 person man carriage and a 5 tonne battery operated locomotive entered the eastern man winding compartment of the No. 2 Main Shaft of Vaal Reefs East Gold Mine on the 56 level, shortly after a double deck man cage containing 104 men passed that station. The man carriage and the locomotive struck steelwork in the shaft and broke up into several parts. It is probable that parts of the man carriage and locomotive struck and penetrated the fully laden man cage with lethal force, causing the death of an unknown number of occupants, especially in the top deck of the cage. It is also clear that, as a result of falling objects striking the rope attachments and the man cage, the humble hook detached from the winding rope causing the man cage to plummet to the shaft bottom. Those who survived the initial impact between the falling objects and the cage were killed when the man cage struck the shaft bottom. Other falling objects struck the Mary Ann cage which was stationary on 62 level, injuring 9 persons therein. Fortunately none of these injuries were reportable.

The names and identity numbers of the 104 deceased, the exhibit numbers of the post mortem reports and the statements relating to identification and transportation of the bodies are set forth in Annexure "B".

2. CIRCUMSTANCES PRECEDING THE ACCIDENT

Upon arriving on 56 level at approximately 20:12, a locomotive driver found a 30 person man carriage approximately 6 metres from the shaft gates, followed by his locomotive (54B) about 750mm behind it. He conducted certain checks and then boarded the locomotive and plugged in the Anderson plug (connecting the battery power) to check whether the lights and hooter were operative. As the Anderson plug was plugged in, the locomotive ran away towards the shaft. The driver was unable to stop the locomotive so he jumped off just before the locomotive entered the shaft.

3. BACKGROUND INFORMATION

No. 2 Shaft at Vaal Reefs consisted of some 12 levels using 85 locomotives to tram some 72 690 tons of ore monthly over 31 km of underground track. A total of 2 944 persons worked underground daily on morning shift and 603 persons on night shift. The main shaft which is 2 133 metres deep, is serviced by:

(i) A double drum man and material winder with two double deck cages (maximum permitted load 50 persons per deck).

(ii) A koepe rock winder with two 14,5 ton skips.

(iii) A double drum service winder (Mary Ann) with a single double cage (maximum permitted load 30 persons per deck) and a counterweight.

On 56 level some 456 metres above shaft bottom at No. 2 Shaft there is 4,7 km of track with 5 battery locomotives and 1 diesel locomotive operated by 26 locomotive drivers (drivers and guards).

An average of 160 material cars are lowered on a daily basis at No. 2 Shaft with approximately the same number being raised again. In order to facilitate the loading of cars into or out of the cage, a set of tracks runs directly into the shaft, that is into the cage when positioned on the level, but into the shaft if the cage is not in position. To protect against vehicles on the tracks from entering the shaft when the cage is not in position a variety of safety devices (arrestors) have been designed and used on various mines. We have heard much about the industry standard in this inquiry but the only written evidence introduced was a Chamber of Mines document titled "Recommended Practice for Safe Operation of Laterial Underground Transport" (Exhibit VR52). This document of some 40 odd pages contains only one paragraph (7.1.1) that refers to station layout: "The station layout should include a device or devices to prevent cars, hoppers or locos inadvertently entering the shaft. Examples of such devices are small traps with removable rails, removable barriers, hinged barriers, rotating shaft car stops and spring loaded switches". There were also many references to the Vaal Reefs mine standard which calls for at least a tank trap, a farmgate and a "no loco beyond this sign" board.

In fact on 56 level the following safety devices were supposed to be in position (See Exhibit VR1 page 15 and 16 and VR21):

(i) Shaft gates;

(ii) A tank trap 4,03m from shaft gates;

(iii) An aeroplane sprag chained 4,48m beyond the tank trap;

(iv) A "No locomotive beyond this board" sign 23,45m beyond the aeroplane sprag;

(v) A farmgate 0,57m beyond the "No loco" sign; and

(vi) Another aeroplane sprag 2,34m beyond the farmgate.

Shortly after the accident the following were found on 56 level (Record p747 G.E. Ellis, p1446 H.J. Wood Jnr.):

(i) On the east man compartment the eastern side shaft gate was open and damaged, the western side shaft gate had been ripped off and was missing.

(ii) The tank trap was in the correct position and the two 600mm sections of rail were not in position.

(iii) An aeroplane sprag was in position on the track. (This had been placed there after the accident)

(iv) The locomotive restriction sign was in position.

(v) The farmgate was open with the cross member lying against the sidewall.

(vi) The aeroplane sprag was lying next to the track.

Holes in the concrete between the tracks 6,27m from the shaft gates were found. These holes were intended for vertical RSJ stopblocks and were completed approximately 3 weeks before the accident but the pieces of RSJ had not yet been supplied (Record p1062 line 10 De Swardt).

4. INSPECTION IN LOCO

On 4 August 1995 the following places at Vaal Reefs were visited:

(i) 56 Level No. 2 shaft station area including the main station crosscut, the material loop, the Mary Ann crosscut and the haulage including the tip area.

(ii) The winder engine rooms of both the man winder and the Mary Ann (service) winder.

(iii) The No. 8 shaft surface training centre where a demonstration was given by F. Mucache, a locomotive driver instructor. It was demonstrated what pre-use checks a locomotive driver was required to carry out before the driver actually drove off.

(iv) Machinery store where parts recovered from No. 2 shaft were being stored.

This was the first official inspection in loco, except for one organised by the Government Mining Engineer on 16 May 1995, and because of the large amount of persons present (representatives of all parties, the media and mine officials) the inspection was pretty chaotic but still proved useful in orientating everybody as to the operations of a mine.

It was noted at the inspection in loco that the mine had installed vertical RSJ stop blocks in the holes provided before the accident and had provided a means by which they were locked. The key being in the possession of the onsetter.

5. BATTERY LOCOMOTIVES AND CONTROLLERS

Professor Case is a professor in the department of electrical and electronic engineering in the Faculty of Engineering at RAU. His particular area of interest and expertise is power electronics which was the subject of his research for his PhD. He has also been a practising engineer. Together with Mr. C.V. Rutter, Professor Case prepared three reports which were commissioned by the Government Mining Engineer for this Inquest/Inquiry. The subject of the first was the controller of locomotive 54B (Exhibit VR99), the second on the condition of locomotive 26B (Exhibit VR100) and the third the performance of a battery locomotive when various safety devices were rendered inactive (Exhibit VR103). The research was done with the input of experts representing the interests of all the parties including the driver of locomotive 54B.

Professor Case described how mine locomotives operate. The drive systems of electrical locomotives such as the one in question comprise three elements i.e. the battery, the motor and the controller. The function of the controller can be compared to that of a switch. The operation of the locomotive is based upon the application of electromagnetic principles which he described in detail.

While the motor is operating, it generates a voltage. When the battery voltage is higher than the voltage of the motor, current flows into the motor. If the energy generated by the motor is returned to the battery, the motor is braked (this is the electrical braking effect).

The devices in the controller, which were described by Professor Case are:

(i) The logic card which ensures that the circuit integrity and operation is maintained within design parameters and which disables the current and hence the locomotive when it is not.

(ii) The thyristors or silicon rectifiers (SCR's) which allow current to flow in one direction only.

(iii) The fuse which is designed to fail before the thyristors fail and which fails at current loads above a specified level thereby protecting components of the circuit.

(iv) The line contactor which is a switch which closes the circuit and allows current to flow. The line contactor also diverts excess current and protects the logic card and the circuit from overload.

(v) The shunt which is a device for measuring the magnitude of current flow as described by OHM's law (V = I x R). It is connected to the logic card by means of sensing wires, two of which are connected to the negative terminal and two of which are connected to the positive terminal of the shunt. The sensing wires enable the controller to "read" the voltage differences across the shunt. When the logic card receives signals indicating that the current loads are higher than specified levels, it releases the line contactor, interrupting the flow of current.

(vi) The control lever which is manipulated by the driver. This lever is springloaded and returns to a neutral position as soon as it is released. When the circuit is operating as designed, as the lever moved through the neutral position, the locomotive is automatically braked electrically.

Professor Case and Mr. Rutter examined those components of the drive system of locomotive 54B which were recovered after the accident, making the following observations:

1) The motor was in good condition and in working order.

2) The battery was 80% charged. It was white in colour, which is the colour of batteries used on the morning/dayshift.

3) The fuse was bridged out.

4) The line contactor was bridged out.

5) One directional thyristor was recovered. The directional thyristor was electrically sound, and the main thyristor was open-circuit i.e. damaged by overcurrent.

6) The sensing wires (4 in all) connecting the shunt to the logic card were not connected across the shunt (two at the negative and two at the positive terminal) but to one terminal only i.e. the card could not obtain a signal which indicated the magnitude of the current flowing through the circuit.

7) A number of devices (the two voltage diodes and the current amplifier which receives signals from the shunt) in the logic card were damaged by overcurrent.

8) The shunt was burnt off (fused, blown or parted).

9) The battery circuit breaker was not recovered.

Based upon their observations, Professor Case and Mr. Rutter reached the following conclusions:-

a) If the shunt had been burnt off before the accident, the locomotive could not have operated under its own power. It can be inferred from this conclusion that another locomotive (26B), which was operating under power, would be necessary to push locomotive 54B and the man carriage into the shaft. Such a conclusion would be quite inconsistent with locomotive 54B driver's evidence.

b) If the shunt was still intact, given that the line contactor and the fuse were bridged out, indicating respectively, that the logic card was not operational and the circuit had no protection against over current, the locomotive was in a dangerous condition. Once the battery is plugged in, the slightest movement of the controller (including the accidental brushing of a sleeve against it) in the direction in which the locomotive was still capable of movement, would cause the locomotive to run away out of control. Such a scenario is entirely consistent with the driver's version.

It accordingly became critical to establish if it were possible to do so, which of the above scenarios was correct. Further examinations were conducted and the following observations were made:

1. The locomotive traversed the tank trap at very low speeds (of the order of 1,5 km/h).

2. A locomotive driver would not be able to detect the bridging out of the line contactor from the circuit and therefore the loss of safety functions would not be apparent to a driver. This raises an important probability in favour of the driver's version for it would mean that, not knowing of the possibility of a runaway, if this evidence is false it would mean that he invented such a story within seconds of the accident.

3. Excess current resulted in wheel slip.

4. In tests, fusing of a shunt was attained only when the brake was applied fully. While the motor was able to rotate, however slowly, the shunt did not fuse as the current was too low to generate sufficient heat.

5. In the tests the operator was able to bring the locomotive under control easily.

Professor Case generalised from these findings that the shunt would not have fused during the accident and therefore it must have fused before the accident i.e. the locomotive did not enter the shaft under its own power.

Before dealing further with Professor Case's evidence, it is necessary to refer briefly to the Metallurgical evidence of Mr. James with respect to the shunt. Mr. James said inter alia in his evidence, that fusion of the shunt probably occurred before the locomotive entered the shaft but he was not able to offer an opinion on the precise time of fusion. It follows that on his evidence the fusion could have occurred after the man carriage entered the shaft, but just before the locomotive did so and the earlier momentum of the locomotive would thus not be inconsistent with the driver's version. Mr. James' evidence does not take the case any further.

To return to the evidence of Professor Case. In his earlier evidence he testified that he was "morally certain" that his conclusion was correct. That conclusion was, to some extent, diluted by the cross-examination of Mr. Freund on behalf of the driver. His conclusion was also less emphatic when he was recalled to testify by the Presiding Officer, on 30 October 1995. He was recalled after the evidence of the driver had been given and after the evidence of the eye-witness and other witnesses had been given. Within seconds of the accident the driver was observed in a demented and panic-stricken state of shock. At that stage and later he stated that the locomotive had run away. That was why Professor Case was recalled and he was asked about the possibility of the driver's version being true in the light of his conduct immediately after the accident. When all of this was put to him and it was suggested that the shunt might have fused just before the accident, i.e. that locomotive 54B may have gone down the shaft under its own power, Professor Case replied "I have <u>never</u> (my underlining) excluded that possibility." Viewed in its entirety, I do not think that it would be correct to conclude, as was urged by Mr. Loxton, that Professor Case's evidence is destructive of the evidence of the driver.

6. SHAFT GATES AND STATION SAFETY DEVICES

The industry standard, the mine standard and what was on 56 level at the time of the accident have been described in paragraphs 3 and 4. Counsel for Vaal Reefs submitted that mine personnel had relied on the fact that the safety devices on 56 level complied with the "Industry Standard". There is in fact no industry standard as such but the safety devices on 56 level were similar to the norm used on many other mines. Counsel for NUM in their reply submitted "that reliance on such standard can be successful only if it is demonstrated that such standard is in itself a reasonable one and, in the context of this case, that such standard is the result of reasonable attention to relevant incidents." This is clearly not the case as can be seen by the evidence of Mr. Watson (Consulting Engineer for the Goldfields Group) who admits that even though he is aware of instances of locomotives having gone down shafts, he has not heard of anybody in the industry who has, as a result of that knowledge, specifically designed safety devices to stop runaway

locomotives from entering a shaft. "One has to have a severe accident to really bring these things to mind" (Watson p4430).

Vaal Reefs had a distinct warning in the form of an accident in July 1992 (the 1992 accident) which is discussed in paragraph 7.

7. THE 1992 ACCIDENT

On 4 July 1992 a non-casualty accident occurred on 70 level at No. 2 Shaft. The accident report (JN1168/92 Exhibit VR69) read as follows:

"While the train of fifty three material cars was being pushed to the shaft station, four material cars fell down the shaft".

The mine's inquiry into the accident listed under the heading: "What acts, failure to act and/or conditions contributed most directly to the incident?"

Substandard acts:

1) Failure to recognise hazard of a long train around a corner.

2) Careless behaviour from locomotive driver by speeding.

3) Operating at unsafe speed.

Substandard conditions:

1) Insufficient guards for pushing train around corner.

2) Incorrect design of station tankpit and stopblock.

The stopblock in use at the time was a pivoted stopper inserted in the tankpit (Exhibit VR89). The force of the train against this stopper caused pivot bolts to be sheared off and the stopper fell over causing a bridge to be formed over the tankpit. This made it easy for the cars to run over the pit.

The following was listed as "Action taken to prevent recurrence".

Immediate

1) Disciplinary action taken against locomotive supervisor and onsetter's assistant.

2) Stopblocks will be removed from tankpits.

Permanent

1) Re-design and installation of stopblock at station tankpits.

Comments by Chief Engineer (R. van den Heever) "Imperative that modifications to stopblocks and tank trap be carried out as soon as possible".

The accident was investigated by the acting section engineer and the shaft mine overseer but they missed the most important element being that the accident was caused by the force of the impact of a train being pushed by a locomotive under power. The workers involved were disciplined, the stopblocks were removed from the tankpits but nothing else was done until the shaft mine overseer found old tumbler stopblocks in the timber yard. He discussed these with the section engineer who had returned from leave. He was given the go-ahead and installed them on several levels. Capital was obtained and all the stations were equipped. The only tests that were conducted were tests by pushing material cars by hand into tankpits. These tests were conducted by the shaft mine overseer and the cars were successfully stopped.

Some months after installation of the tumbler stopblocks the shaft mine overseer decided to remove them because:

1) Operating staff were leaving them in an open position by placing a heavy object on the operating handle.

2) They required excessive maintenance.

This was done after consulting with the section engineer and it was then decided to install vertical, removable RSJ stopblocks on all shaft stations at No. 2 Shaft. The shaft mine overseer in Exhibit VR40A says "I decided to have these (RSJ stopblocks) installed as an additional measure in order to prevent cars pushed by hand by the onsetter to fall into tank traps. I also decided to start on busy levels on the sub shaft and from there to work upward to the top levels."

Mr. Proudfoot on p374 of the record says: "It came to my attention that there was a stopblock hole on 56 level, ... I was informed that they are upgrading the safety devices on the station and there is a programme out of how far that upgrading is and I was told that was as a result of a survey done at numbers two and eight shafts." This was only after the accident and even though he was not questioned in detail as to what survey he was referring to, it can be assumed that it is the Roets report (See paragraph 8). Mr. W.L. Roets in his report says: "The SMO (Shaft Mine Overseer), however, tells me that he is in the process of installing additional arrestors".

From the warnings received from the 1992 accident and the Roets report (plus other accidents in the industry), the mine management should have applied their minds to investigating, designing and installing safety devices capable of arresting locomotives under power on their stations.

The mine had at their disposal the services of design engineers and draughtsmen in the Regional Engineering Services. "We would have the facilities for calculating the strengths of mechanical components in the system". (Stopblocks to stop locomotives of different weights moving at different velocities) (J. Amis Record p672 line 22).

8. THE ROETS REPORT

During the latter part of 1994 the manager of Vaal Reefs South, Mr. A.J. Wilkens commissioned Mr. W.L. Roets to conduct an audit of No. 2 and No. 8 shafts at Vaal Reefs as part of his programme of acquainting himself with the mine.

"Upon assuming my position as Mine Manager of No. 2 and No. 8 shafts (10 September 1994) I undertook a number of analyses to identify critical areas of loss in the areas of safety and general production. With regards to shafts I felt it desirable to employ an expert on Shaft Safety Systems and Procedures to act as an extra pair of eyes." (Affidavit: A.J. Wilkens - exhibit A1179). (My own emphasis)

Mr. Wilkens continues:- "I thought it beneficial that an outsider should evaluate the shafts to bring new insight to bear. I had previously worked with Mr. W.L. Roets, who is an expert in the field of Shaft Safety Systems and Procedures. In my view his many years of experience qualified him to provide me with assistance in the field of Shaft Safety Systems and Procedures". (My own emphasis)

From the above it is evident that Mr. Wilkens:

1) Wished to identify critical areas of safety.

2) Considered Mr. W.L. Roets an expert on Shaft Safety Systems.

3) Considered it beneficial that an outsider should evaluate the shafts and provide him (Mr. Wilkens) with assistance in the field of Shaft Safety Systems.

THE REPORT

"Audit on Vaal Reefs Nos. 2 and 8 Shafts by Mr. W.L. Roets November 1994" was presented by Mr. Roets on 8 December 1994. In this report Mr. Roets stressed that his report was "an unbiased viewpoint based on many years of experience" and that "the time period available to the Consultant allows only to scratch the surface." He goes further to say that his suggestions can by no means benefit these operations if they are not tried and successfully implemented.

In paragraph 3 entitled "Shaft Accidents" he seriously criticised the lack of communication about accidents between various shafts on the mine and says: "if causes of these accidents were to be circulated to other shafts, action can be taken to prevent similar accidents."

In paragraph 4 entitled "Means of Arresting Runaway Cars" he says:

"In my opinion the present arrestors are insufficient on the banks and stations. The SMO (Shaft Mine Overseer), however, tells me that he is in the process of installing additional arrestors. I suggested that he considers the vula vala system in addition to the other systems, although I am told that the present system complies with Mine Standards."

Mr. Wilkens in paragraph 4 of his affidavit (Exhibit A1179), says that after attending Mr. Roets' presentation "it was clear that in general, Mr. W.L. Roets was satisfied with the Safety Systems and Procedures at the relevant shafts, that such systems were in general complied with and that they compared favourably with industry standards." In paragraph 4.1 he goes further "While he (Mr. Roets) was satisfied that the existing bank and station safety arrestors were adequate if in place, he was of the view that a vula vala device was preferable because it could not be in an open position". This is clearly in direct contrast with the wording of Mr. Roets' paragraph 4 (Exhibit VR70) - "In my opinion the present arrestors are insufficient on the banks and stations." (My own emphasis)

If Mr. Roets was an expert on shaft safety and Mr. Wilkens wished to identify critical areas by paying an outside consultant to evaluate his shafts, then it would be expected of Mr. Wilkens (as a reasonable mine manager) to pay attention to the report of his expert consultant and to insist on immediate action by instructing his engineers to study the report, investigate possible alternatives and to report back with recommendations. Mr. Wilkens chose to leave such an important decision "to the discretion of the relevant Shaft Engineers". He also put too much reliance on the surmise that the existing devices compared well with the "Industry Standard" and complied with the "Mine Standards".

9. THE MIDNIGHT MEETING

On 10 May 1995, some hours after the accident, the following people assembled in the office of Mr. H.J. Peens:

H.J. Peens	-	(GES) General Engineering Supervisor
L.J.F. le Roux	-	Foreman Electrician
B. Potgieter	-	Foreman Electrician
O. van Aswegen	-	Foreman Fitter
H. du Plooy		Foreman Fitter
H. Wood Jnr.	-	Engineering Safety Officer

Mr. H. Wood Jnr. had been underground to 56 level and had seen the damage caused by the accident and had heard the locomotive (54B) driver's account of what had happened. Mr. Frank Khoza, the underground section electrician in charge of 56 level had been called out.

When Mr. Khoza entered the office, Mr. Peens asked him in what condition his locomotive (54B) was. He replied that this locomotive was not in a good condition and that parts were bridged out. Mr. Peens told him that he and his foreman had killed people. Mr. Le Roux then asked Mr. Khoza what had become of the spares he had sent down. The reply was that he had locked them in his box. Mr. Wood left the office and returned with Mr. C. Norval, the section engineer. Mr. Norval told Mr. Peens that no accusations were to be made and that a court case would follow where the facts would emerge. (Record p3874).

Despite knowledge at that early stage of the fact that parts on locomotive 54B had been bridged out prior to the accident, no mention of this fact was made by Mr. Peens, Mr. Le Roux, Mr. Wood Jnr or Mr. Khoza in any of the statements that they made to officers inquiring into the cause of the accident. In fact in some of the statements made, locomotive 54B was reported to be in good condition.

After the midnight meeting Mr. Khoza and a fitter, Mr. J.J.S. Bronkhorst, filled in job request sheets and logbooks pertaining to various locomotives that had not been filled in timeously when required. These reports were countersigned by Mr. Le Roux who permitted this to be done.

10. THE CAUSES OF THE ACCIDENT

(a) Direct Causes

This accident was not caused by a single direct cause but by a number of causes:-

(i) Locomotive 54B and the man carriage were parked in a prohibited area i.e. behind the "No entry" sign in the station area.

(ii) The electric circuit of Locomotive 54B was bridged out and damaged to such an extent that it would run away at the slightest touch of the control lever (even an accidental brushing of a sleeve against it) in any direction unless arrested by mechanical means.

(iii) The acts and omissions of the driver, Mr. Mpota, which consisted of:-

a) using locomotive 54B at all instead of reporting its position to his supervisor.

b) using locomotive 54B without a skid sprag in place.

c) not conducting a pre-check inspection and, if he did, it was of the most perfunctory kind. In particular inserting the Anderson plug without the brake being first applied.

(iv) The absence of an adequate safety device which would have stopped the man carriage and Locomotive 54B from entering the shaft.

(v) The opening of both shoulders of the humble hook.

(vi) With regard to 4 of the deceased there was a miscount as only 100 are permitted in the cage.

For the reasons which follow, (i), (v) and (vi) can be eliminated from further inquiry.

In the case of (i) there is no evidence before us which shows who placed locomotives 26B, 54B and the man carriage in the prohibited area. The summary below reflects the evidence relating to the movements of the three vehicles on the 9th and 10th May 1995, who used them and who observed them in what position. It is clear from that summary of the evidence that we have no evidence at all as to what happened to those vehicles from about 17:00 until they were seen in the prohibited area about three hours later.

With regard to (v) i.e. the opening of both shoulders of the humble hook the evidence is clear that the humble hook was in good working order as observed by Mr. James. He gave direct evidence on this point and the humble hook is dealt with in his report, Exhibit VR123. Moreover, the humble hook has been in use in the mining industry for over 100 years and this is the first occasion when both shoulders of the humble hook have opened when correctly used.

So far as (vi) is concerned, the counting of men going into the cage is done by the banksman with the assistance of station marshalls. As men are in a hurry to get into the cage, particularly in winter, a good deal of pushing and shoving takes place. Mr. Prinsloo was asked whether it would not be better to have a

turnstile system but he stated that it had been tried but was unacceptable both to the Unions and to the workers. Negotiations were presently in progress in order to ascertain what improvements can be effected. I am unable to find that any negligence in this regard has been proved against the mine, the banksman or the station marshalls. This point need not therefore be considered any further.

SUMMARY OF EVIDENCE: MOVEMENT OF VEHICLES

DATE	VEHICLES	WITNESS	SHIFT	BEGINNING	DURING	END
9 May	MAN CARRIAGE	-	Morning	-	-	-
		-	Afternoon	-	-	-
		-	Night	-	-	-
	LOCOMO-TIVE 54B	Mabuza (driver 54B)	Morning	-	Towed to battery bay	Battery bay
		Mathe (Concor driver)	Afternoon	Station X-cut, in from 26B	Drove 54B to battery bay	Battery bay
		Mpota (driver 54B)	Night	Battery bay	Battery bay	Battery bay
	LOCOMO-TIVE 26B	-	Morning	-	-	-
		Mathe (Concor driver)	Afternoon	Station X-cut (end of) correct side of no-entry sign. 54B blocking passage into haulage	-	-
		-	Night	-	-	-
10 May	MAN CARRIAGE	Rivers (rigger)	Morning	-	09:00 not seen on station (no locomotives no mancarriage)	-
		Goya (guard 26B)	Morning end shift	-	-	- no material cars - no man carriage on station
		Mabuza (driver 54B)	Morning	-	41B pulled man carriage	-
		Dlamini (miner)	Afternoon	Man carriage blocking haulage, pushed into Station X-cut	-	-
		Cako (guard 41B)	Afternoon	-	Material cars, followed by man carriage and locomotive 54B. (Material cars extend to farmgate)	-
		Onsetter Du Plooy and assistants Ngilan and Potsane	Afternoon	-	16:00 - 17:41 man carriage (and two locomotives) behind material cars and between farmgate and switch	-
		Makheda (battery bay assistant)	Afternoon (end)	-	-	20:00. 10-12 paces from the shaft gates, 4 paces from the tank trap. (disputed correctness of consultation note obtained through an interpreter that the wheels of the mancarriage were on the edge of the tank trap).

DATE	VEHICLES	WITNESS	SHIFT	BEGINNING	DURING	END
10 May	MAN-CARRIAGE	Motemekoane (driver)	Afternoon (end)	-	-	20:00 Disputed correctness of statement A4 that the mancarriage was 30 metres from the shaft. Estimated in evidence that it was nine to ten metres from the shaft gates. Points, in evidence, to a position on the map 14m from the shaft gates. Concedes in evidence that the mancarriage may have been closer to shaft gates than estimated.
		Mpota (driver 54B)	Night	20:00 According to Wood Jnr's notes the mancarriage and the locomotives were between 10 to 15 metres from the shaft as pointed out by Mpota. In evidence Wood said that Mpota pointed out that the front of the mancarriage was 10 to 15 metres from the shaft gates. Disputed by Mpota (through counsel) who places the mancarriage 6m from shaft gates. Statements A1 and A1.1: taken shortly after the accident and while in hospital, man-carriage 3m from shaft gates (says that he was confused, in shock). In evidence places the mancarriage 6m from the shaft gates.	-	-
	LOCOMO-TIVE 54B	Sephton (electrician)	(Early hours May 10)	Battery bay	Battery bay	Battery bay
		Mabuza (driver 54B) Khoza (electrician 54B)	Morning	Battery bay (service)	Removed from battery for work at 11:00 to 11:30 a.m.	Tips (in front of 26B)
		Mathe Matsinhe (Concor drivers)	Afternoon	Station X-cut haulage end (behind 26B, furthest from haulage)	Not used. At 16:30 Station X-cut haulage end, behind 26, furthest from haulage	-
		Mucavele (afternoon shift crew supervisor)	-	Taken into South haulage by Concor drivers. X-cut, 2km from station, broken down)	-	-
		Cako (driver 41B)	Afternoon	54B in Station X-cut, at switch (taken there by Concor) 13:00 hours. Wanted to change direction of hoppers. Used 54B which moved very fast. Pushed it back to where it was found (at stop sign) 13:00 hours	-	-
		Quluba statement (driver 41B)	Afternoon	Wanted to change direction hopper. Used 54B moved too fast in both directions. Left it near the farmgate. Did not take it to battery bay too dangerous to drive A8	-	-

DATE	VEHICLES	WITNESS	SHIFT	BEGINNING	DURING	END
10 May	LOCOMO-TIVE 54B	Onsetter and assistants Du Plooy Ngilana Potsane 16:00 - 17:41 (banksman log)	Afternoon	-	Ngilana: between farmgate and switch; in order from farmgate, mancarriage, 2 locomotives (mancarriage and locomotive coupled) Potsane: 3 vehicles, mancarriage and 2 locomotives between farmgate and switch (mancarriage and locomotive coupled, mancarriage between uprights and farmgate) Du Plooy: just beyond farmgate, which was closed, was mancarriage and a locomotive (could have been another)	-
		Motemekoane (driver)	Afternoon shift (end)	-	-	Directly behind mancarriage (no space in between).
		Makheda (battery bay assistant)	Afternoon	-	-	Directly behind mancarriage.
		Mpota (driver 54B)	Night	0,75m behind mancarriage, between the switches on the shaft station.	-	-
	LOCOMO-TIVE 26B	Mabuza (driver 54B)	Morning	-	-	At tips was parked behind locomotive 54B
		Goya (driver 26B)	Morning	-	-	Battery bay
		Mathe (Concor driver)	Afternoon	Haulage end of station X-cut	Used by him and his guard	Haulage end of Station X-cut
		Cako (driver 41 B)	Afternoon	-	Saw contractors using 26B (after they had used 54B). Used 26B with help of contractors to change direction of his hoppers	-
		Onsetters and assistants Du Plooy Potsane Ngilana	Afternoon	-	Behind material cars, between farmgate and switch	-
		Makheda (battery bay assistant)	Afternoon	-	-	Behind 54B, in front of which was the mancarriage.
		Motemekoane (driver)	Afternoon	-	-	Behind 54B, in front of which was the mancarriage.
		Mpota (driver 54B)	Night	-	-	1m behind, 54B in front of which was the mancarriage.
		Rantho (driver 26B)	Night	-	-	After accident, on station
		Panyane (driver 41B)	Night	Walked with Rantho to tips. 41B at tips, 26B not at tips	-	-

(b) Indirect causes

(i) Problems associated with parking of locomotives and man carriages.

(ii) Training of locomotive drivers.

(iii) Training of electricians and underground section electricians.

(iv) General state of the electrical department.

(v) Communication of accident information.

(vi) Continual changes of management.

(vii) Dependence on out-dated standards.

(c) Other Causes

(i) Prior to the accident no hazard analysis of shaft station safety devices, to anticipate the probability of such an accident, had been done.

(ii) The safety culture on the mine is not well established i.e. employees were inclined to say "This is not my responsibility."

(iii) Although safety is preached on the mine, employees are still inclined to sacrifice safety "in order to get the rock out of the mine".

(iv) No safety devices designed to stop a locomotive under power were considered necessary on stations even though previous accidents had occurred.

11. SECTIONS OF THE MINERALS ACT OR REGULATIONS CONTRAVENED

The following Sections of the Minerals Act (Act No. 50 of 1991) have prima facie been contravened:-

Section 31(1)(a)(ii)
..... manager ..... who shall

(ii) take all reasonable measures to ensure the safety and health of employees and.....

Section 37

No person shall, by any negligent act, wheresoever committed, or by any negligent omission:-

a) endanger or probably endanger the safety or health of any person in or at a mine or works; or

b) cause serious bodily harm to any person in or at a mine or works.

Section 59

No person shall hinder, oppose or obstruct any officer or any other person in the exercise of his powers or the performance of his duties conferred or imposed on him by this Act.

The following Minerals Act Regulations have prima facie been contravened.

Regulation 3.11

Any person through whose neglect, wrongful act or omission a contravention of any regulation shall occur or who permits, incites, instigates, commands or procures any person to contravene any regulation, shall be deemed to be guilty of such contravention, without prejudice to any responsibility or liability on the part of the manager or of any other person.

Regulation 3.12

Any person who fails to obey any order given to him in accordance with or for the proper observance of the requirements of these regulations, or any order whatsoever given in the interests of safety or health, by any person lawfully authorised to give such order, shall be guilty of a contravention of these regulations.

Regulation 3.14

No person shall:-

a) interfere with or render ineffective anything which has been provided for the protection, safety or health of persons; or

b) alter, remove or in any way interfere with or render ineffective or disregard any arrangement provided for the purposes referred to in paragraph (a) unless duly authorised thereto in writing by the manager, mine overseer or engineer.

Regulation 16.91.8

The banksman, onsetter or other person authorised to give signals for winding operations shall acquaint himself with the maximum number of persons authorised by the regional director to travel at any one time in the cage and on each deck of the cage, or in the skip or other means of conveyance and shall not allow such maximum to be exceeded.

Regulation 18.2.2.1

No person operating a self-propelled mobile machine shall leave such machine unattended unless he has taken reasonable precautions to prevent it from being set in motion by an unauthorised person.

Regulation 20.7.3

No person shall set a machine or machinery in motion unless he has taken all reasonable precautions to ensure that no other person can be injured by the setting in motion thereof.

Regulation 20.9.1

Every safety appliance at a mine or works shall be maintained in good working order and properly used.

Regulation 20.9.2

The using of any apparatus or of any machinery which does not comply with the provisions of these regulations, or the working of any apparatus or of any machinery the using of which appears in any way to be or to have become dangerous, shall immediately be stopped. Until such time as such apparatus or machinery complies with the requirements of these regulations, or such dangerous condition has been rectified, such apparatus or machinery shall not be used.

Regulation 21.1.1.1

All electric apparatus shall be selected, installed, worked, marked and maintained in such a manner as not to constitute a hazard and shall be placed and protected in such a manner that no person can be injured by inadvertent contact with any live portion thereof.

Regulation 21.3.1

All electric apparatus in which a fault may develop which may endanger persons shall be provided with effective switching, controlling or protective devices which, in the event of a fault, shall be capable of automatically isolating the power supply to such apparatus.

Regulation 21.4

No person shall interfere with or render ineffective any electric apparatus provided for safety or protection unless it is necessary to do so to perform work associated with such apparatus.

12. CONCLUSIONS/RECOMMENDATIONS

I. I concur with the conclusions arrived at in the Joint Inquest/Inquiry i.e. the acts and/or omissions which brought about the death of the persons listed in Annexure "B" prima facie amount to or involve offences i.e. culpable homicide on the part of the following persons:-

(a) The underground section electrician responsible for the electrical maintenance of locomotive 54B.

(b) The afternoon shift locomotive guard of locomotive 41B.

(c) The afternoon shift locomotive driver of locomotive 41B.

(d) The shaft mine overseer of No. 2 Shaft.

(e) The former section engineer responsible for No. 2 Shaft.

II. I am also of the opinion that

(f) A former mine manager of Vaal Reefs Mine (In charge of No. 2 Shaft from 10 September 1994 to 15 March 1995) is also prima facie guilty of culpable homicide in that he failed to pay the necessary attention to the written report of his expert consultant

(Mr. Roets) in December 1994 i.e. "In my opinion the present arrestors are insufficient on the banks and stations".

III. Vaal Reefs Exploration and Mining Company Limited is also prima facie liable to prosecution for the offence of culpable homicide for the reasons set out in the Joint Inquest/Inquiry report.

IV. In addition to the main charge of culpable homicide the following persons are prima facie liable to prosecution for an offence as contemplated in Section 37(a) and (b) of the Minerals Act and for contraventions of other sections of the Minerals Act or regulations as stated below:

(a) The underground section electrician responsible for the electrical maintenance of locomotive 54B:-

Regulation 3.12 read with mine standards, in that he did not conduct maintenance in accordance with his training and instructions and also he failed to make true and correct entries in the logbooks provided for that purpose.

Regulation 3.14(a) and (b), Regulation 20.9.1, Regulation 20.9.2, Regulation 21.1.1.1 and Regulation 21.4, in that he removed and rendered ineffective safety devices on locomotive 54B that were installed on this locomotive for safety and protection of persons.

(b) The afternoon shift locomotive guard of locomotive 41B and

(c) The afternoon shift locomotive driver of locomotive 41B:, Regulation 3.12 and Regulation 20.9.2, in that they both, having experienced the dangerous ranaway condition of locomotive 54B, and having knowledge of the fact that locomotive 54B could be operated by any person (magnetic key bridged out), they left it where it could be used without informing their superiors or calling out the maintenance staff

(d) The shaft mine overseer of No. 2 Shaft:

Regulation 3.14(b) and Regulation 20.9.1, in that he removed a safety device on 56 level station that had been provided for the protection, safety or health of persons without first installing some alternative arrangement in its place.

(e) The former section engineer responsible for No. 2 Shaft:

Regulation 3.14(b) and Regulation 20.9.1, in that he allowed the shaft mine overseer to remove a safety device on 56 level station that had been provided for the protection, safety or health of

persons without applying his mind to correctly designing a new device and for failing to heed the imperative command of his superior.

(f) A former mine manager (10 September 1994 to 15 March 1995):

Section 31(1)(a)(ii) of the Minerals Act, in that he failed to take all reasonable measures to ensure the safety and health of employees at his mine, by not paying the necessary attention to the written report of his expert consultant (Mr. Roets).

V. The following persons who are not considered prima facie guilty of culpable homicide are however prima facie liable to prosecution for an offence as contemplated in Section 37(a) and (b) of the Minerals Act and for contraventions of other Sections of the Minerals Act or Regulations as stated below:-

(g) A former mine manager (1 February 1992 to 9 September 1994):

Section 31(1)(a)(ii) of the Minerals Act, in that he failed to take all reasonable measures to ensure the safety and health of employees at his mine, by not adequately following up after the two shaft accidents in 1992 and by not instructing his engineers to investigate and/or design more efficient shaft station arrestors.

(h) The night shift driver of locomotive 54B:

Regulation 3.12 read with the mine standards and the locomotive driver's lesson plans, in that he failed to use a skid sprag under the wheel of his locomotive and also failed to ensure that the mechanical brake was fully fastened before he plugged in the battery power to his locomotive. He also failed to report to his superior that he found his locomotive in a restricted area near the shaft.

(i) The morning shift locomotive driver of locomotive 54B:

Regulation 20.9.2, in that he became aware that the controls of locomotive 54B had been reversed during the morning servicing but he failed to stop the use of this potentially dangerous locomotive. Only the fact that he had not experienced the run-away condition, as did the locomotive 41B drivers, makes him prima facie not guilty of culpable homicide.

VI. The following persons are considered to be prima facie liable to prosecution for an offence as contemplated in Section 37(a) and for

contraventions of regulations as stated below due to the following reasoning:

Regulation 2.13.4.1 defines the engineer's responsibility as

(a) being responsible for the safe installation and proper operation, running and maintenance of all machinery and

(c) he shall take all reasonable measures to ensure that

(i) all safety appliances, mechanisms and guards are maintained in good condition; .....

In order to enable the Engineering Manager to comply with the requirements of regulation 2.13.4.1, the mine appointed several section engineers to look after various sections of the mine and each section engineer was given a sub-structure consisting of a general engineering supervisor, a shaft mine overseer, a safety officer, several foremen and various artisans and other workers to carry out maintenance on all machinery. A system of recording the maintenance carried out was also instituted, consisting of logbooks and job report forms to be filled in on a daily basis. Such a system would constitute an arrangement provided for the protection, safety or health of persons (Regulation 3.14) and any failure to complete logbooks or job report forms on a daily basis can therefore be considered as a prima facie contravention of Regulation 3.14(b). The filling in of logbooks and job report forms is also one of the only ways in which the engineer and senior management can ensure that Regulations 18.2.2.1, 20.9.1, 20.9.2, 21.1.1.1, 21.3.1 and 21.4 are being complied with and failure on the part of:

(j) the foreman electrician in charge of locomotive 54B

(l) the general engineering supervisor of No. 2 Shaft,

(m) the engineering safety officer of No. 2 Shaft, and

(n) the section engineer of No. 2 Shaft, to ensure that the responsible artisans complete their logbooks and job report forms timeously can prima facie be considered as negligence in terms of Section 37(a) of the Minerals Act and a contravention of Regulation 3.14(b).

VII. The following artisans who were in arrears with entries in logbooks should be charged with contravening Regulation 3.12 read with Regulation 3.14(b) for the same reasons as in VI above:

(a) the underground section electrician in charge of locomotive 54B.

(o) the fitter in charge of locomotive 54B.

(p) the electrician on night shift duty on the night of 9 May 1995, and.

(q) the electrician in charge of 68 level.

VIII. During the Inquest/Inquiry it became evident that certain people knew (at approximately midnight on 10 May 1995) of the fact that certain critical parts of the controller on locomotive 54B had been bridged out and that this was at the least a contributory cause of the accident. These persons not only chose to conceal this knowledge from the police and the officers investigating the accident but several of them gave statements to the contrary. This can be construed as a prima facie contravention of Section 59 of the Minerals Act and also possibly a case of attempting to defeat the ends of justice. These persons are:-

(a) the underground section electrician in charge of locomotive 54B. He proceeded to write "in order" on job report forms and in logbooks after the accident.

(j) the foreman electrician in charge of locomotive 54B. He countersigned the entries made by (a) above.

(l) the general engineering supervisor.

(m) the engineering safety officer. He had been underground and had seen the results of the accident and should have appreciated the facts of the matter better than others because he was also a trained electrician.

IX. Arising from VIII above the following persons are also liable to prosecution for contravening Regulation 3.11;

(j) the foreman electrician in charge of locomotive 54B

(l) the general engineering supervisor of No. 2 Shaft,

in that they both permitted artisans to sign job reports and logbooks that were in arrears after the accident of 10 May 1995.

X. It is possible that there was a technical contravention of regulation 16.91.8 but for the reasons given in paragraph 10(a) of this report no person should be prosecuted for a breach of this regulation.

XI. Arising from the inquest/inquiry the following contravention not causally connected to this accident was found:

(t) The nightshift driver of locomotive 26B, Regulation 3.12 read with the mine standard and the locomotive driver lesson plans in that he

(i) did not conduct a full pre-use check on locomotive 26B before driving it on 10 May 1995.

(ii) drove locomotive 26B on 10 May 1995 without his guard being in attendance and giving him the necessary signals. This is also a contravention of regulation 20.7.3.

(iii) neglected to ensure that the farmgate and the aeroplane sprag were replaced in their correct places after removing locomotive 26B from the station crosscut.

(iv) failed to inform his superior of the fact that his locomotive was parked in a restricted area.

Except for the above no further action is recommended.

A.J. McKENZIE
CHIEF REGIONAL MINING ENGINEER
MINING EQUIPMENT
FREE STATE REGION
INVESTIGATING OFFICER: VAAL REEFS DISASTER
1996-04-18

ANNEXURE “B”

	FULL NAMES	ID NO.	EXHIBIT	STATEMENT
1.	JOSEPH LEPHOI LEPOTA	LEM0087331	VR65	A104-A111
2.	NINKI MODISE	BTL0064788	“	A112-A120
3.	SEMENEKANE LETEBA	LEJ0000188174	“	A121-A129
4.	MOEKETSI MOOROSI	LEH00028376	“	A130-A139
5.	MOHAU JACOB KHOTSO	LEL00042734	“	A140-A149
6.	TUMELO IVIN GAOPEGWE	BP000455241	“	A150-A159
7.	ERNEST RETSELISITSOE MOKOTJO	LEH00020238	“	A160-A168
8.	JONGIKHAYA JOYI	TRT3107587	“	A169-A177
9.	ESAIA MOKAKE	LEJ00054200	“	A178-A186
10.	MOSES DLAMINI	SWC0000019321	“	A187-A195
11.	MBONGENI MBONISWA	6509055908085	“	A196-A204
12.	HLOMO LETSELA	LEK000143144	“	A205-A213
13.	MOKETO SALIMONE MOHANELA	LEH000270721	“	A214-A222
14.	ALFRED MOTHUSI MASILO	7001115348089	“	A223-A231
15.	MOROKENG JOSEPH MAEKANE	LEL00043613	“	A232-A240
16.	MBUZENI DUMA	5202015842088	“	A241-A249
17.	MOKOTO PAUL KABELI	LEJ000040199	“	A250-A258
18.	PHILEMON MSEBENZI CHALA	6303036595082	“	A259-A266
19.	KITLOBOTLHOKO BALOSANG	BOL00058958	“	A268-A276
20.	AMOS DLIBAYI MGIBISA	4803015713087	“	A277-A285
21.	RAPANYA MOTLALANE	LEJ0000011576	“	A286-A294
22.	DAVID CHANJALANE PACHO	MOU0004687	“	A295-A303
23.	NOBUKUMKANI KINDNESS GODLO	5407130788088	“	A304-A312
24.	MOSEOU MICHAEL RAMOKHELE	LEM0000171566	“	A313-A322
25.	THABANG MOSIA	LEL00166753	“	A323-A332
26.	HABOFANOE SAMOEL MOSELI	LEL0000077001	“	A333-A342
27.	MOSIMANYANA SAM GOLELELOANG	5805016004084	“	A343-A352
28.	TSHOHLEHO ISDORA PHEKO	LEL000097765	“	A353-A361
29.	JOHANNES LEUTSOA MOTSOARI	LEK000007164	“	A362-A370
30.	MOLAHLEI JOSHUA POOPA	LEK00100425	“	A371-A380
31.	PHILA ALFRED GAZU	7211285287088	“	A381-A390
32.	LAWRENCE LUMKO LANGUZA	6405015972081	“	A391-A400
33.	NTIME LAWRENCE RAMAFOLE	LEM000133856	“	A401-A410
34.	MATHOLE PHOKOJOE	LEH052652	“	A411-A420
35.	ARLINDO MANDLATE	MCU0008970	“	A421-A430
36.	NEO EMMANUEL LEEMA	LEM0086077	“	A431-A440
37.	MEFIKA EMMANUEL MASUKU	SWC00008030	“	A441-A450
38.	SETEI NENA	LEK0143298	“	A451-A460
39.	MATEUS CAMO	MOZT001346	“	A461-A470
40.	VUYANI MPETSHENI	6010305729082	“	A471-A480
41.	SENZO CIEBERT MSIYA	6501055693080	“	A481-A490
42.	MOTLALEPULA MOHOEBE	LEKL0007091	“	A491-A500

	FULL NAMES	ID NO.	EXHIBIT	STATEMENT
43.	LOOKBOY BUKA KOTOKO	5C52050	VR65	A501-A510
44.	FANA SAMSON MNDLULI	6603235481087	"	A511-A520
45.	SIYABULELA CHWABA	159432710	"	A521-A530
46.	RAMOSILINYANE BERNERT MOLISE	LEK000152107	"	A531-A540
47.	WAZIR AMADE	MOV0008367	"	A541-A550
48.	JOHANNES SECHELE	LEK00090469	"	A551-A560
49.	PAULO NDLANE	MOB00261	"	A561-A570
50.	SIMON LEBOTHOLI MOLOMO	LEH00407238	VR66	A571-A580
51.	MOSIUOA MOABI	LEJ00006721	"	A581-A590
52.	KALISO JOSEPH MAPHAKA	6601165833087	"	A591-A600
53.	ESSAU MOTEBANG MEJOANE	LEK000190872	"	A601-A610
54.	ANTONIO DANGANE	MOX0000582	"	A611-A620
55.	POTLAKI THUNTSA	LEH000187058	"	A621-A630
56.	FRANCE JACKSON NKUNA	3630626	"	A631-A640
57.	LIPHAPANG SELLO	LEH000183915	"	A641-A650
58.	MMBOHO JOSEPH KAMELE	LEM00161568	"	A651-A660
59.	ITUMELENG MAJARA	LEJ00128855	"	A661-A670
60.	ALBERT RAYMOND MAZIBUKO	6605165931080	"	A671-A680
61.	MOLEFETSANE MICHAEL SERITI	LER000160139	"	A681-A690
62.	KEMELO SHAKANE	LEJ000099696	"	A691-A700
63.	BHEKIZITHA PAULOS MADLALA	6911055663084	"	A701-A710
64.	JABULANI ELPHAS DLAMINI	SWC00130960	"	A711-A720
65.	SIPHIWO BHOLO	6210106616088	"	A721-A730
66.	JERRY WISA TSELA	SWL000044022	"	A731-A740
67.	MOATLHODI SIMON KOOLATOTSE	BTL0122599	"	A741-A750
68.	TIELE MOABI	LEK00101830	"	A751-A760
69.	JOBO POTJO	LEH000191278	"	A761- A770
70.	RANTSOAFI KHASAKE	LEK000090449	"	A771-A780
71.	KHOALANE DANIEL MAPOTA	LEM000156913	"	A781-A790
72.	TEBALO RAMOLALA	B000046247	"	A791-A800
73.	MOKHALINYANA KHOFU	LEK000010510	"	A801-A810
74.	MATHEALIRA RAISI	LEJ00059214	"	A811-A820
75.	VUYANI ROMANUS NDLOVU	6801265794085	"	A821-A830
76.	BANKIO GOLOTSE	BTL0048769	"	A831-A840
77.	PHOMOLO ALBERT MAFISA	LEK009A5200	"	A841-A850
78.	LERONTI TEEMANE PHAHLAHLA	LEH0037829	"	A851-A860
79.	MOSHEMANE ALBERT MFUNDISI	LEK000045474	"	A861-A870
80.	ROMAO SOLOMONE	MOTU0004541	"	A871-A880
81.	ELIAS TELLO MOSELE	LE00116913	"	A881-A890
82.	MOSHE MOSES MOKOTSO	LEH0274702	"	A891-A900
83.	LOURENCO LAZAO MASSINGUE	MOCD00029143	"	A901-A910
84.	RAOSHIMA DITOWE	BTL00064800	"	A911-A920
85.	BUTA PETROSE MOHLAKOANA	LEK000019526	"	A921-A930

	FULL NAMES	ID NO.	EXHIBIT	STATEMENT
86.	JULIUS JULIUS LETELE	LEK00075687	VR66	A931-A940
87.	LETHOLE ISHMAEL THOKOA	LEJ00043067	"	A941-A950
88.	BEKOKWAKE SANGWENI	6844475	"	A951-A960
89.	PETROSE MOLISE MABALA	LEK0000192797	"	A961-A970
90.	MOROKE KATIBA	LOL000090013	"	A971-A980
91.	JOSEPH LEPHALLO MONTOELI	LEM00136187	"	A981-A990
92.	MOEKETSI JOSEPH MAFEREKA	LEK000135132	"	A991-A1000
93.	ALBERTO FOTINE	MOB0002398	"	A1001-A1010
94.	MBINGANYI JARABANE	BTL0101423	"	A1011-A1020
95.	MOFEREFERE WILLIAM MAQOABIKANE	LEH00110637	"	A1021-A1030
96.	ARCHIEBOLD MZIWAMAMFENE NYAMZA	5385178	"	A1031-A1040
97.	VELLEM TSHUKUMISA GXAGXA	5504015866086	"	A1041-A1050
98.	BOTOTO DANIEL SEAPATLE	BOL00074501	"	A1051-A1060
99.	PETRUS TSEPANE	6711075246088	"	A1061-A1070
100.	TEBOHO EDMAND THABANA	LESH253824	"	A1071-A1080
101.	SICELO SOGA	4906165900089	"	A1081-A1090
102.	LETSOLO MATSOELE	LE000030721	"	A1091-A1100
103.	SEETA SEBASTIAN CHOPHO	LEJ00025347	"	A1101-A1110
104.	BOITUMELO JOSEPH MOSESANE	BP0000262490	"	A1111-A1120

ANNEXURE "C"

RECORD OF EXHIBITS HANDED IN DURING THE INQUIRY:

WITNESS	EXHIBIT	DESCRIPTION	DATE
R.C. Proudfoot	VR1	Statement	1/8
"	VR2	Policy Statement	1/8
"	VR3	Quick Read Reference	1/8
"	VR4	Training Policy Statement	1/8
"	VR5	Glossary of photographs	1/8
"	VR6	Anatomy of a Gold Mine	1/8
"	VR7	3 Dimensional Poster	1/8
"	VR8	Shareholders Plan	1/8
"	VR9	Ore Transportation Summary	1/8
"	VR10	Breakdown of Shaft Configurations	1/8
"	VR11	Plan: Boundaries of No. 2 Shaft	1/8
"	VR12	Vertical Section through No. 2 and No. 5 Shafts	1/8
"	VR13	Plan of Shaft Section No. 2 Main Shaft 56 Level	1/8
"	VR14	Number 2 Shaft, Shaft Schedule	1/8
"	VR15	Information regarding Locomotives	1/8
"	VR16	No. 2 Shaft Plan depicting workings on 56 Level	1/8
"	VR17	56 Station Layout and Station Plan	1/8
"	VR18	No. 2 Shaft Plan of 56 Level Station	1/8
"	VR19	Organogram	1/8
"	VR20	56 Level Accident Plan (File M)	2/8
"	VR21	Plan of 56 Level Station Haulage	7/8
"	VR21A	Dimensions of Rolling Stock	22/8
"	VR22	Section of 56 Level Station Haulage	7/8
"	VR23	View AA through 56 Level Station	7/8
"	VR24	Same Plan of 56 Level	7/8
"	VR25	Photograph Album	2/8
"	VR26	Flow Chart	2/8
"	VR27	File H	2/8
"	VR28	Simulation video	2/8

WITNESS	EXHIBIT	DESCRIPTION	DATE
R.C. Proudfoot	VR29	File A	2/8
"	VR30	File B -	2/8
L.G. Biggs	VR31	Affidavit	11/8
R.C. Proudfoot	VR32	File K	3/8
"	VR33	File C	3/8
"	VR34	File D	3/8
"	VR35	File E	3/8
"	VR36	File F	3/8
"	VR37	File G	3/8
"	VR38	File I	3/8
"	VR39	File J	3/8
"	VR40	File L	3/8
"	VR41	File N	7/8
"	VR42	File O	7/8
"	VR43	File P	7/8
"	VR44	File Q	7/8
"	VR45	File R	7/8
"	VR46	File S	7/8
"	VR47	File T	7/8
"	VR48	File U	7/8
"	VR49	File V	7/8
"	VR50	File W	7/8
"	VR51	File X	7/8
"	VR52	File AA	7/8
"	VR53	File Y	7/8
"	VR54	File Z	7/8
E.J. Amis	VR55	Affidavit by Mr. E.J. Amis	7/8
C.B. Enslin	VR56	Photograph Albums 1, 2 and 3	7/8
	VR57	Affidavit by Mr. C.B. Enslin	7/8
P.A. Goosen	VR58	Affidavit by Mr. P.A. Goosen	7/8
"	VR59	Affidavit by Mr. H.J.P. Olivier (A1177)	15/11
R.C. Proudfoot	VR60	U/G Inspection list	8/8
"	VR61	Schedule of posts at Vaal Reefs	10/8
J.C.C. Badenhorst	VR62	Affidavit by Mr. J.C.C. Badenhorst	11/8
H.S. Grobler	VR63	Affidavit by Mr. H.S. Grobler	11/8
Lt. J.F. Pienaar	VR64	Statements Al to A103	14/8
"	VR65	A104 to 570 + A1132 + A1133	14/8
"	VR66	A571 to A1120	14/8
"	VR67	A1121 to A1131 + A1135 to A1158	14/8
"	VR68	Photo Album	14/8
S.J. Bekker	VR69	Accident Reports	15/8
"	VR70	Audit on Vaal Reefs	15/8
J.J. vd Westhuizen	VR71	Man Winder Logsheet	15/8
"	VR72	Mary Ann Winder Logsheet	15/8

WITNESS	EXHIBIT	DESCRIPTION	DATE
P. Louw	VR73	Man Winder Lock Bell Recorder	16/8
"	VR74	Mary Ann Lock Bell recorder	16/8
"	VR74A	Lockbell Recorder Mary Ann (9/5)	25/8
"	VR74B	" " Mary Ann (10/5)	25/8
"	VR74C	" " Man Hoist (9/5)	25/8
"	VR74D	" " Man Hoist (10/5)	25/8
"	VR74E	Special Signals	16/8
"	VR75	Banksmans Original Logbook	16/8
"	VR76	Man Winder Winding Engine Drivers Logbook Carbon Copies	16/8
"	VR77	Man Winder Winding Engine Drivers Logbook - Original	16/8
"	VR78	Mary Ann Winding Engine	
"		Drivers Logbook Carbon Copies	16/8
"	VR79	Mary Ann Winding Engine Drivers Logbook Original	16/8
"	VR80	New Organogram	16/8
"	VR81	Health & Safety Agreement	16/8
"	VR82	Truck & Tramming Accidents	16/8
"	VR82A	Truck and Tramming Accidents	21/8
"	VR83	Vaal Reefs Accident Statistics	16/8
"	VR83A	Vaal Reefs Statistics	21/8
"	VR84	Accident Comparison 1990 to 1995	16/8
"	VR84A	Underground Accidents Comparison	21/8
P. Louw	VR84B	Underground Accidents Comparison	21/8
"	VR85	Comparison of Fatality Rates	16/8
A.H. Taute	VR86	Thesis: A.H. Taute	21/8
"	VR87	Industrial Relations Incidents	21/8
H.J. Wood	VR88	Station Layout Plan	25/8
H.J. Peens	VR88A	Station Layout Plan	7/11
H.J. Wood	VR89	Accident to Sub Shaft (4/7/92)	25/8
"	VR90	Employee Report	25/8
"	VR91	T & T Reportable Accidents	25/8
"	VR92	Reportable Accident Code Book	25/8
"	VR93	Accidents involving Rolling Stock	25/8
"	VR94	Mary Ann Passengers (10/5/95)	25/8
"	VR95	CSIR Investigation Videos	25/8
"	VR96	Notebook: H.J. Wood	28/8
"	VR97	Memorandum: H.J. Wood	28/8
"	VR97A	Drivers Certificate: T.L. Mpota	28/8
"	VR98	Brink Cohen Le Roux Letter	28/8
"	VR98A	State Attorney Answer	28/8

WITNESS	EXHIBIT	DESCRIPTION	DATE
M.J. Case	VR99	CSIR Report: Electronic Controller & Electrical Investigation	29/8
"	VR100	Consultancy Report: Locomotive 26B	29/8
F. Khoza	VR101	F. Khoza's Notebook	31/8
"	VR102	Personal Progress sheet	31/8
M.J. Case	VR103	CSIR Report: Evaluation of Performance of Locomotive	4/9
F. Khoza	VR104	Memorandum	5/9
"	VR105	Safety Management Notebook	6/9
"	VR106	Summary of common faults	6/9
"	VR107	Materials Management	6/9
"	VR108	Number 2 Shaft Inquiry	7/9
"	VR108A	N.F. Khoza: Training	7/9
M.J. Parker	VR109	CSIR Report: Inspection of hand brake assembly	8/9
"	VR110	Tests carried out at Goodman Power	8/9
P. Hind	VR111	CSIR Report: Dynamic Characteristics of Locomotive	8/9
P. Carter	VR112	CSIR Report: Rope Tests	8/9
"	VR113	CSIR Report: Humble Hook	8/9
"	VR114	Investigation of Detaching Gear in U.K.	8/9
N.F. Khoza	VR115	AAC: Final Test Module Eng. T.C.5-1	11/9
"	VR116	AAC: Final Test Module Eng. C.4 (2M)	11/9
"	VR117	Weekly Inspection: Loco 54B	11/9
"	VR118	Machinery Report Book	11/9
"	VR119	All Electrical & Mechanical Artisans	11/9
"	VR120	Statement: J.L. Sephton	11/9
B. Koosaletse	VR121	Clocking History: 10 May 1995	13/9
P. Hind	VR122	CSIR Report Scenarios around Dynamics of locomotives (6A)	18/9
	VR122A	CSIR Report: Scenarios around Dynamics of Locomotives (6B)	18/9

WITNESS	EXHIBIT	DESCRIPTION	DATE
A. James	VR123	CSIR Report: Visual Examination of the Rope etc.	18/9
"	VR124	CSIR Report: Results of Paint, Metal Silver etc. Tests	18/9
"	VR125	Additional Work Carried out on Current Limit Shunts	18/9
		ADJOURNED TO 30/10/95	
F. Mucache	VR126	Loco Driver Training Instructions (English Translation)	2/11
"	VR127	" (Fanakalo)	2/11
J. Sephton	VR128	Callout Sheet 9/5/95	6/11
F. Mucache	VR129	Loco Training Manual	6/11
H.J. Peens	VR130	Loco Log Book	7/11
"	VR131	Correspondence between Legal Council and Mine	7/11
"	VR132	Expo 92 Book	8/11
"	VR133	Expo 94 Book	8/11
"	VR134A	Photos	8/11
"	VR134B	Photos	8/11
"	VR134C	Photos	8/11
"	VR134D	Photos	8/11
"	VR135	Artisans Callout Sheets	10/11
H.J. Esterhuizen	VR136	Video: Huizen Stopblock	13/11
I. Watson	VR137	Video: Vula Vala Test	13/11
C.C. Sealy-Fisher	VR138	Video: Measures to Reduce Risk	13/11
"	VR139	Video: Tank Trap Tests	13/11
H.J.P. Olivier	VR140	Training of Underground Section Electricians: Vaal Reefs	15/11
		ADJOURNED TO 1/02/1996	
M.J. Prinsloo	VR141	Fact Finding Inquiry	2/2
"	VR142	Accident Report	2/2
P.J. Louw	VR143	Safety Code of Practice	5/2
"	VR144	Visit to Firestore on 1995/07/04	6/2
W.J. Massyn	VR145	Shiftboss Logbook	7/2
"	VR146	Battery Electric	7/2