

## Appin Colliery Explosion Reassessed

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It is over 30 years since the Appin Colliery explosion since the Report of the Judicial Inquiry was produced. That Report can be seen as the official historical reference to what occurred. Those who look for answers as to how the explosion occurred and how it can be prevented will be disappointed in the report.

The explosion occurred in a development panel while a planned ventilation changeover was being carried out. A three-heading layout was being changed from two intakes and one return to a single central intake shielded by returns on each side. It is appropriate to mention that the reason for the change was the relatively high percentages of methane in the intake roadways.

Figure 1 called stage 1 shows the original layout with an overcast being built at 3C/T in preparation for the changeover.

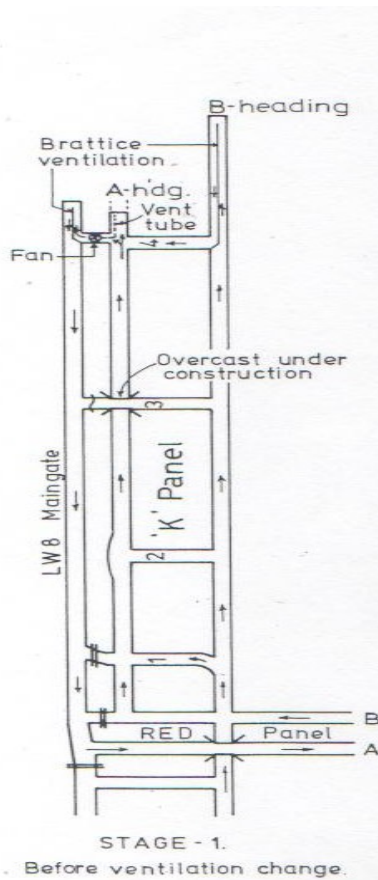


Figure 1. Original Layout

Figure 2 shows the intended changeover procedure with stage 2 portraying the establishment of the changed airflow by completion of the overcast, erection of a brattice stopping in B heading outbye of 3C/T and removal of the stopping in 3 C/T. Stage 3 shows the intended completion of the changeover with a fan operating in B heading

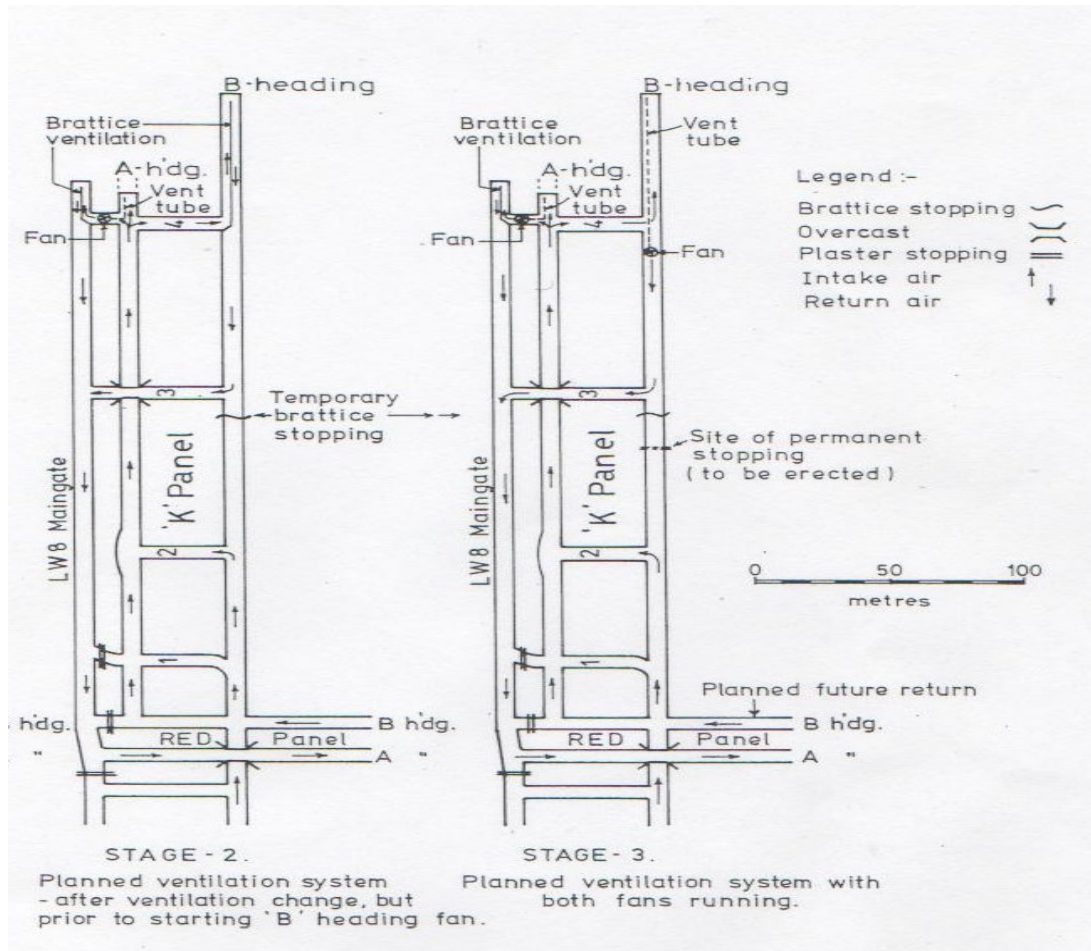


Figure 2.Planned Procedure

At the end of the shift before the explosion a deputy sent to assess progress found that a brattice stopping had been erected in B heading and though it had been stapled on the wrong side of the props was not considered to be a problem. However he was concerned that there appeared to be considerable leakage coming from the overcast. Although he had been expected to remove the 3 C/T brattice he did not do so.

Figure 3 shows the situation as it was last seen.

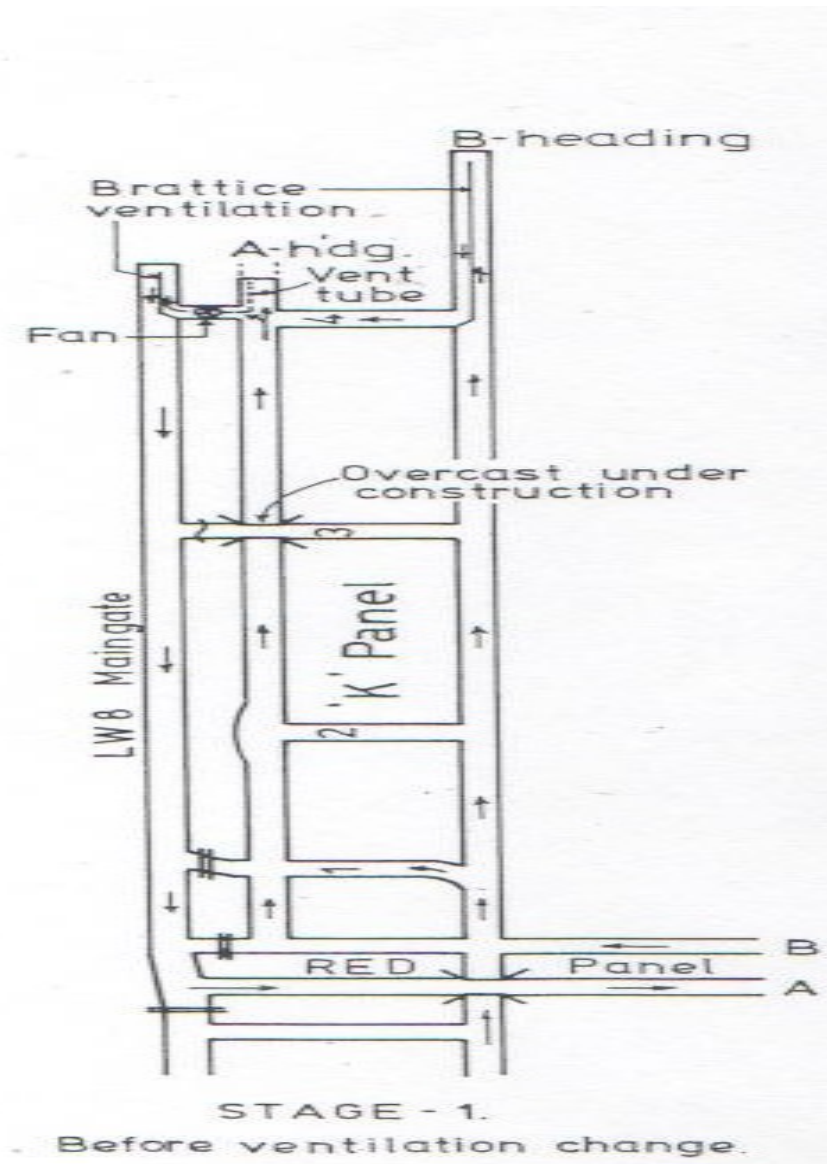


Figure 3. Position At End Of Shift Before The Explosion

It was not possible to establish when or even if the 3C/T brattice was removed, this may be in part because there did not seem to be clear lines of communication or responsibility

Considering that two crews were sent to the panel on the following shift it may have been appropriate to ask 'Was there management pressure to get the changeover done in a hurry'. That question did not appear to be considered but it was established at the Inquiry that the probable reason for the overcast leakage was that holes in the overcast had been filled with brattice.

Halfway through the next shift, while most of the workmen were in the crib room, the Deputy the assistant Undermanager and the electrician were near the fan and the fitter was nearby when the explosion occurred.

The following matters were accepted by the Inquiry:

- 1 The fan on start-up had probably been running in reverse
- 2 The fan cable was live at the time of the explosion.
- 3 The starter-box was not in a flameproof condition at the time of the explosion.
- 4 The explosion wave traveled up the vent tubes and initiated a violent outward explosion.

The Judicial Inquiry found that the ignition of methane started in the fan starter-box but could not explain how the gas got into the box nor how the ignition was transferred to the vent tubes so that the major explosion began at the face of the heading. One of the compelling reasons for the decision was that after the explosion a blast pattern was found in the starter box. Considerable effort was taken to prove that the blast pattern could not have been caused by an external explosion. No attempt was made to consider whether the blast pattern could have been formed when the starter-box was in a flameproof condition that is to consider if gas had been in the starter-box when the was first started.

Another question unasked was 'If gas could enter the box and be the source of the ignition why wasn't there an explosion of the gas outside the box.

To account for the starter-box as the initiator of the explosion it is necessary to consider the following matters:

- 1 Did the Deputy test for gas ?
- 2 Did the Deputy assess the airflow ?
- 3 Were steps taken to prevent an explosive mix passing through the fan ?
- 4 Would there have been evidence of recirculation ?
- 5 Should gas around the fan starter-box have been noticed ?( both the Deputy and the Undermanager had flame safety lamps which would have been extinguished if the gas was in the explosive range)
- 6 Who would allow the fan to be started with the box non-flameproof ?

If the fan starter-box was the cause of the explosion then obviously there were a number of missed opportunities to detect the danger and a valid but unasked question should have been 'Did these omissions indicate a general lack of safe practice at this mine?'

The subsequent Coronial Inquiry was less positive about the cause of the explosion, it was recorded as being more likely to be the fan starter-box but could have been the Deputy's LOFSL.

The factors which led to the suggestion that the lamp could have been involved were:

- 1 The lamp which had its wick set for a carrying flame was damaged but it had an overload of Pyrophor and the relighting key was missing.(It is important to note that a lamp overloaded with Pyrophor can produce a spark as the key is being pulled out)

- 2 The Deputy was found in the shuttle car.( this was a logical place for the Deputy to be placed if he was separating the vent tubes and controlling the airflow to ensure that the air passing through the fan was not high in methane)
- 3 Relighting flame safety lamps in the presence of gas has been recognized as a danger.

Much was made of the fact that the Judicial Inquiry was conducted in the presence of eminent legal representatives who were apparently satisfied that all relevant information was available to the Inquiry. This position raises two questions:

- 1 Does a legal representative set out to find out how the disaster happened or just to present his client in the best light?
- 2 Would an investigation by an independent mining expert give more definite and therefore useful answers about how such a disaster happened and particularly how a recurrence should be avoided?