



Queensland Government
Natural Resources and Mines

*Report on the Simulated
Emergency Exercise
held at
Newlands Colliery*



Saturday, 25 November 2000

EXECUTIVE SUMMARY

The third of Queensland's Level 1 emergency exercises introduced a number of different elements to an already rigorous test of a mine's emergency response capabilities.

This year's exercise was held at the Newlands mine with the exercise being initiated through two separate and unrelated events late on a Saturday evening. This strategy was designed to challenge the initial response protocols and the emergency declaration triggers in place at the mine, and to examine the call-out times of a mine approx. 2 hours driving time from the weekend domiciles of a number of key mine personnel.

Additionally, this years exercise provided the opportunity to evaluate the use of compressed air breathing apparatus (CABA) as a component in emergency response. The outcomes of the exercise clearly demonstrated that CABA adds a powerful weapon to the armory of the self-escape philosophy. Its flexibility, ease of use and ability to facilitate communication makes it well suited to the cause of emergency response, particularly as it provides a rapid, in-seam first response capability.

Finally, a small number of the underground workforce were intentionally prevented from evacuating to a place of safety in order to evaluate their survival strategies once it became apparent that their self-rescuer oxygen supply would not sustain them until assistance arrived. Their innovative and ingenious final solution was most successful and those persons are to be commended for their actions.

Throughout the exercise, it was apparent that the Newlands Emergency Preparedness and Response Plan was comprehensive, well conceived, well practiced and "owned" by the whole of the workforce. The standard of decision making exhibited by the deputies and workforce underground was admirable, and the technical expertise and control of circumstances demonstrated by the Incident Management Team was most creditable.

One of the fundamental purposes in the conduct of these exercises is to evaluate current practice and generate discussion on improvement opportunities. The following pages detail not only the successes of the exercise, but equally, highlights a number of important issues for consideration by the industry in general.

Further, the report contains a number of recommendations specific to the exercise and several others for broader attention. The analysis covers the full scope of the audit, however specific detail is provided on the need for the appointment of key control personnel to surface and underground incident sites and the need for tighter integration of the self-escape CABA resources and first response protocols, with the aided-rescue resources and personnel provided by the Qld Mines Rescue Service

In conclusion, the assessment team found all the Newlands personnel (and contractors) to be most professional, willing and capable in the approach and prosecution of their emergency response. I would like to thank them, and the assessment team, for their contributions and trust that this report will further add to the energy and knowledge pool of our industry's emergency response capability.



Greg Rowan

Chairman Emergency Exercise Management Committee

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KEY FINDINGS AND RECOMMENDATIONS

Findings

1. A coordinated combination of Self-Escape and Aided Rescue strategies has again proven itself as a most effective vehicle in enhancing survival of underground personnel
2. Compressed Air Breathing Apparatus (CABA) provides a powerful addition to the armory of resources supporting these strategies. Its ability to provide a rapid in-seam response was clearly demonstrated in the event time-logs compiled during this exercise
3. The Emergency Response capability at the Newlands mine is comprehensive, well conceived and resourced, practiced and “owned” by the whole of the workforce
4. Emergency Response activities need to recognise the vital strategic importance of maintaining effective control of key locations, eg underground emergency site/s
5. All persons should be aware of facilities provided to allow emergency communication hardware to be installed such that inbye communications are not disrupted
6. Current Status white-boards detailing the deployment of personnel and resources should be commenced as soon as an emergency is declared. These boards assist greatly in scenario planning and provide vital information during review and hand-over activities
7. There is a need for the Assessment Teams at future exercises to solve the problem of maintaining a sense of urgency and realism at simulated emergency sites

Recommendations

1. It is recommended that a forum of stakeholders be urgently established to develop and implement a set of protocols covering the interactions between mine-site first-response teams and external aided-rescue organisations. Each of these parties provide specialist, but separate, skills and resources and it is vital that the issues involved in their interactions be identified and coordinated. There is little doubt that CABA teams will increasingly form part of emergency response capabilities in our industry and we must be prepared
2. It is recommended that the functions inherent in current gas monitoring software be explored, particularly the facility to store and retrieve documents detailing required Action Response Plans. Such software has much to offer Control Room Operators and IMT personnel
3. It is recommended that the ergonomics of the CABA main valves be reviewed and modified (if possible). The need to turn two valves in different directions using different hands will inevitable give rise to circumstances where both cylinders are not fully operated

PART A: THE EXERCISE

PLANNING AND CONDUCT OF EXERCISE

A number of planning meetings were conducted and a detailed risk assessment process was undertaken during the development of this exercise scenario. The scenario and subsequent events were based on the hazards and risk profile specific to Newlands mine.

The scenario itself was based on a fire initiated by a fault in the transformer at cut-thru 2. C→D heading Main Dips. Through a series of events, detailed in *Transformer Scenario*, the transformer acted as the energy source to ignite a fire in the coal roof and ribs. The fire grew rapidly as it consumed fuel in the roof and ribs and spread throughout the cut-thru. Combusting coal in the roof eventually reached the far side rib of 2cut-thru → D heading, where it burnt through the tube bundle monitoring lines.

The fire was seemingly brought under control following the application of low-expansion foam applied from both sides of the cut-thru. However, combustion was still occurring in the coal roof strata, eventually resulted in a fall of the weakened roof in the intersection at 2 cut-thru → D heading. Following this fall, the combusting roof coal was exposed to the fanning effect of the full ventilation flows in D heading and again rapidly grew out of control. Further application of low-expansion foam from the out-bye side of the fall again brought the fire under control.

It should be pointed out that at no stage was the transformer itself on fire.

All mine atmospheric and ventilation monitoring data was provided through the mine control room, in real time and in a format compatible to computer assisted analysis and system interrogation. As in previous years, the software program developed by SIMTARS proved invaluable in the provision of this data. The data was presented in formats identical to those used at Newlands and with which the personnel at Newlands were familiar.

It was anticipated that the exercise would be attacked on four fronts:

1. In-seam evacuation of personnel using self-rescuers and compressed air breathing apparatus (CABA)
2. Fire fighting and control by in-seam and/or surface directed teams
3. Rescue and recovery of missing personnel by in-seam CABA teams and/or surface directed Mines Rescue Teams

4. Deployment of the GAG inertisation equipment

No constraints were to be placed on the extended deployment of the Queensland Mines Rescue Service teams other than those imposed by QMRS internal policies and procedures, or on the mine's internal emergency response teams.

The practice previously adopted by the Emergency Exercise Management Committee of providing advance notice of the “window” during which the exercise was to be conducted was continued, and advance notice provided to all stakeholders, including the police, community, media and emergency services.

In recognition of the international interest now being generated by these exercises, the Exercise Management Committee has been requested to detail the names, qualifications and experiences of its members. It is imperative that these exercises be conducted with the greatest regard for transparency and it is with pleasure that I include this information as an Appendix to this report.¹

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SCOPE

To conduct an Emergency Exercise in accordance with the “Guidelines for the Conduct of Emergency Procedures Exercises” as established by the Moura Recommendations Implementation Task Group 2.

These guidelines proposed that exercises:

- Be systematic;
- Be consistent with the concept of mutual assistance from other mines;
- Require direct reference to the risks at the mine;
- Recognised that exercises should not necessarily be held on day shift;
- Be inclusive of external agencies such as QMRS, police, media and senior company officials;
- Have an audit and evaluation process;
- Be subject to risk assessment principles to ensure the exercises do not introduce new safety risks to persons at a mine;
- Require inertisation equipment to be put in place, as well as confirming airlocks and emergency stoppings on the surface are found to be safely accessible and operative.

In recognition of these guidelines:

- A strategy document was produced establishing the systematic initiation, control and assessment of the exercise;
- Mines signatory to mutual assistance agreements were required to supply mines rescue trainees and GAG operators sufficient to meet the exercise minimum needs i.e. 14 trainees and 3 GAG operators;
- A scenario was developed strictly in accordance with the hazards present at Newlands mine;
- The exercise was conducted on a weekend change over from day shift to night shift, commencing 25th November 2000;
- QMRS, police, media, senior company officials, SIMTARS, Department of Mines and Energy, District Union Inspectors, hospitals, ambulances and doctors were involved;
- Formal audit tools were developed and validated by members of the Emergency Exercise Management Committee. Formal de-briefings of assessors and Newlands personnel were

conducted to evaluate the results. This report is the result of this comprehensive audit and evaluation process;

- Formal risk assessments were conducted at the inaugural meeting of the Emergency Exercise Management Committee held in Emerald on 2 May 2000. This risk assessment covered risks at the mine and risks to the general community;
- Inertisation equipment was called to site and operated.

All audit and assessment tools were developed against the internal procedures of the agencies involved and in line with accepted practice for systems audits.¹

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OBJECTIVES

The objectives of the exercise were to:

- Ensure no personnel injury, equipment damage or introduction of additional risks. Please note that the design of the emergency exercises was done using risk assessment methods
- Test the ability of the current Mine Emergency Procedures, to meet the desired outcomes of an emergency response
- Provide an opportunity to evaluate the use of CABA equipment in an emergency evacuation and response
- Demonstrate a coordinated response involving both Newlands permanent employees and external contractors
- Demonstrate a coordinated response involving Newlands, QMRS, DME, Check Inspectors, SIMTARS, Emergency Services and other stakeholders
- Enhance the confidence and ability of personnel to respond to an emergency
- Allow for a performance analysis and debrief to occur following the exercise, with the outcomes recorded and relevant information disseminated to industry

To meet these objectives, audit and assessment tools were developed to cover the following functions:

- Emergency Initiation
- Emergency Response Plan, including the Duty Card System
- Incident Management and Emergency Control
- Emergency Evacuation
- In-seam Emergency Response
- Location of Personnel and Debrief
- QMRS – Ability to Respond, Mutual Assistance, GAG, Mandatory Performance Criteria
- External Agencies – ability to respond.¹

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SCENARIO

TRANSFORMER SCENARIO

Some days before the incident (a period less than the routine test period for 11kV protection tests), a maintenance electrician replaced a suspected faulty capacitive trip unit and gas pressure trip.

The electrician did not test functionally of capacitive trip unit due to being at an end of shift.

He also did not correctly connect the gas pressure trip gas lines.

The nitrogen gas leaked out, the low pressure gas trip sent a trip signal to 11kV breaker but was unable to trip as capacitive trip unit was incorrectly installed.

11kV feed to the transformer was temporarily de-energised due to tests on surface breaker.

On re-energising the 11kV feed to the transformer, the normal surge (inrush) caused a flashover across the main 11kV terminals of the transformer windings causing major arcing between phases resulting in catastrophic failure of the transformer tank.

The structural failure of the tank (the lid “blew” off) allowed extreme high temperature ionised gas, in the order of 14,000⁰C, burning insulation and molten copper to impinge on the coal roof and ribs igniting the coal.

No one was present to combat the – if anybody had been present they would have received serious injuries or burns.¹

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EMERGENCY SCENARIO

	EFFECT
25 November 2000	
21:00 hours	Start of afternoon shift.
22:13 hours	<ul style="list-style-type: none"> ▪ Methane drainage water-trap at 27 cut-through, B → C Heading damaged. ▪ Line ruptures – issues 600 l/sec into the 40m³/sec airflow in the Dips.
22:21 hours	Surface control room advised by Deputy in the Dips of the damage to the methane drainage line.
22:36 hours <u>Time : T 0:00</u>	<ul style="list-style-type: none"> ▪ Electrical fault in the transformer at 2 cut-through, C → D Heading causes catastrophic failure of the transfer tank. ▪ Underground power trips. ▪ Super-heated ionised gas and molten copper impinge on roof and rib strata – fire develops.
23:39 hours	First Alarm sounded on monitor in Control Room – 5ppm CO No2 D/head
22:46 hours	Choking fumes from electrical failure, burning insulation etc arrive in Main Dips
22:51 hours	Fire fully developed
22:57 hours	Choking fumes from electrical failure, burning insulation etc arrive in Longwall N4
01:03 hours	Fire in roof coal has extended across 2 cut-thru D heading and burns through the tube-bundle monitoring lines
02:30 hours	PROVIDED fire fighting activities have been ongoing for more than 3 hours – all visible flame is extinguished
03:30 hours	Roof fall at intersection of 2 cut-thru and D heading. Burning coal in roof strata re-flares when exposed to full ventilation flow
04:50 hours	PROVIDED fire fighting activities have re-commenced and are on-going – fire out
06:00 hours	Exercise terminated

ASSESSMENTS POINTS AT ISSUE

Notes For Assessment Teams

N1 Crew

- Smoke and or fumes will not enter this panel until 23:40 hrs (T + 1:04)
- Crew members to be supplied with and use training model SSCRs
- If the crew searches appropriately, they will be advised that they have located the fire at 2 cut-through, C → D Heading
- It is anticipated that the crew will locate and don CABA gear and attempt to fight the fire
- Fire fighting attempts will be unsuccessful until approx. 3 hours after coordinated attacks have commenced from both sides of fire using low expansion foam
- Assessors will video-tape their actions with the CABA and fire-fighting
- Communication with control is to be evaluated for frequency, effectiveness and accuracy

Longwall N4 Crew

- Deputy to be isolated from crew prior to notification of smoke
- Crew to self organise with visibility impaired
- Crew members to be supplied with and use training model SSCRs
- Monitor which of the crew takes the limited CABA equipment and how/why such allocations were made
- Evacuate on foot – transport to be disabled
- Monitor communication to control room – note methods of communication with mouth-pieces
- Monitor advice provided/received from control room Re: missing Deputy
- Evaluate actions regarding the missing Deputy - do they conduct a search, if so, by who and for how long, does the crew split up with some evacuating and others searching
- Upon leaving the crib room to evacuate or search, or at 2302 hours, impose ZERO visibility
- Monitor / evaluate use of “blind man” sticks in evacuation
- Video tape the evacuation
- If appropriate, provide facility for Deputy to observe as co-assessor
- Once at FRS 15 cut-thru B → C Heading, evaluate communication, use of additional CABA, return to search for the Deputy
- Once at fire site, 2 cut-through, do they assist in fire-fighting or continue to evacuate

Main Dip Crew

- Crew members to be separated from each other
- At least one person to become disorientated and to remain in section
- Others to evacuate as they deem appropriate or as advised by control – transport may be used
- Assess effectiveness of communications with control room with mouth pieces in
- Crew members to be supplied with and use training model SSCRs
- Monitor / evaluate survival strategies of crew members remaining in section
- For evacuees, once at FRS 15 cut-thru B → C Heading, evaluate communications, use of CABA, are there any CABA units left, do they return to search for missing crew or continue evacuation
- Once at fire site, 2 cut-through, do they assist in fire-fighting or continue to evacuate

QMRS

- Time taken between call-out and turn-out
- Efficiency of mutual assistance schemes
- Evaluate possible conflicts in Roles, Responsibilities and Authorities of Newlands personnel who are also QMRS trainees
- Evaluate communication flows
- Evaluate efficiencies of resource deployment and equipment use
- Monitor interactions / performance / preferences BG174s and CABA
- Monitor deployment strategies of QMRS - to fight fire and/or locate and recover missing persons
- GAG to be mobilised from Dysart station, assembled and test run

Incident Management Team

- Identify independent nature of the two pre-cursor events – damage to the gas drainage line and the loss of power triggered by transformer failure
- Ascertain nature of the true circumstances
- Mobilise personnel and resources
- Collect and correctly interpret data
- Establish objectives and priorities
- Establish and maintain effective communication channels

- Continuous monitoring of progress towards attaining objectives
- Interpret and respond to changing circumstances
- Monitoring of resource deployment and establishment of hand-over priorities
- Ongoing re-evaluation of objectives and priorities
- Regular up-date meetings and checks on communication flows¹

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EXERCISE EVENT LOG

In the course of the exercise, several different Event Logs were compiled by the assessment team and Newlands personnel. The following table is a simplified compilation of the major events and is provided to assist in understanding the interaction of the various activities and processes that necessarily unfold simultaneously during any emergency.

The in depth details regarding these activities are contained within the logs prepared by the assessors and included in the separate sections of this report.

		ELAPSED TIME
2221	Control Room Operator was advised by Main Dips Contractor that the methane drainage line ruptured	- 0:15
2231	CRO contacted Ventilation Officer and Mine Manager	- 0:05
2236	Mains, 2 cut-through transformer explodes and coal fire starts. All underground power tripped at surface breaker	START
2239	CO monitors start to alarm at 5ppm Number 2 drive head cut-through 39.	0:03
2245	<ul style="list-style-type: none"> ▪ Multiple alarms in Control ▪ Thick choking smoke arrives at the faces main dips where four contractors are working 	0:09
2247	CRO called Preparation Plant for assistance	0:11
2248	Two out of four contractors donned rescuers and left Main Dips	0:12
2253	CRO informed the Deputy at N1 that there was 50ppm on the trunk belt and has had no contact with contractors in the Dips	0:17
2257	<ul style="list-style-type: none"> ▪ Deputy at N1 contacted Control to advise of his intended actions to search the Dips for the contractors ▪ During DAC message from CRO smoke entered longwall panel. Crew donned belt worn SCSR units and retreated outbye 	0:21
2300	Open-cut assistance arrived (two persons): <ul style="list-style-type: none"> ▪ 1 x allocated as back-up response controller ▪ 1 x Control Point 1 was established 	0:24

		ELAPSED TIME
2302	N1 Take off Chute crew left the panel travelling inbye via transport	0:26
2303	<ul style="list-style-type: none"> ▪ Longwall crew grouped at crib camp before progressing to FRS and attempted to phone CRO. CRO officer logged “funny voice on phone” and attempted to initiate non-verbal communications. ▪ CRO called open-cut for assistance 	0:27
2305	<ul style="list-style-type: none"> ▪ N1 crew stopped travelling at 10 cut-through Main Dips because of high CO levels and smoke. Crew withdrew further outbye. ▪ Deputy observed smoke through trap door in belt road. ▪ Deputy sent two men to pick up EIMCO and FRS from their panel to go outbye 	0:29
2308	<ul style="list-style-type: none"> ▪ Longwall crew arrived at FRS 19 cut-through and donned CABA units. ▪ Deputy reported to CRO of dense smoke down the belt road and that the panel electrician believed that the transformer blew up at N2 Maingate, 6 cut-through 	0:32
2312	Manager arrived on surface	0:36
2315	Longwall crew contacted CRO and reported missing Deputy and informed route of travel and were ready to depart	0:39
2318	<ul style="list-style-type: none"> ▪ N1 Deputy established that fire was at the transformer at Mains, 2 cut-through and Deputy and crew elected to fight fire. ▪ Open-cut assistance arrived and were utilised as security 	0:42
2320	<ul style="list-style-type: none"> ▪ IMT established ▪ Ventilation Officer arrived 	0:44
2324	Longwall crew depart FRS 19 cut-thru with impaired visibility masks	0:48
2325	CRO instructed by Mine Manager to contact mine site Mines Rescue Coordinator who was to put QMRS on standby	0:49
2326	Dips Contractors (2) called from 10 cut-through, B Heading. They were clear of smoke. Two men still missing in the Main Dips and heavy smoke was observed in the belt road. They removed their SCSR and continued outbye on foot	0:50

		ELAPSED TIME
2345	Four N1 crew commenced fighting fire with hoses whilst under CABA	1:09
2348	<ul style="list-style-type: none"> ▪ N1 crew contacted CRO and reported that the fire was too hot and they were making no head way about to use low expansion foam. ▪ Two Dip Contractors arrive on surface and de-briefed by Mine Manager 	1:12
2353	<ul style="list-style-type: none"> ▪ First Longwall CABA unit sounded warning whistle (55 bar) – wearer donned 60 minute SCSR. ▪ Mine Site Mines Rescue Coordinator arrived on site 	1:17
0015	Local Mines Rescue brigades start arriving (from Newlands)	1:39
0017	GAG unit called out.	1:41
0024	Four out the five Longwall crew on SCSR and one still on CABA	1:48
0027	N2 Panel – fighting fire – requested more men and foam	1:51
0032	Longwall crew arrived 2 cut-through, MG N4 cache and took additional units	1:56
0040	Mines Rescue men to set up FAB at 8 cut-through – stay at phones	2:04
0042	Longwall crew arrived at B15 cut-through QFS	2:06
0057	<ul style="list-style-type: none"> ▪ CRO was advised by the N1 crew that they were out of low expansion foam and cannot get within 20 meters of the fire. ▪ Longwall crew departed QFS with full CABA units 	2:21
0103	Fire extended across intersection of 2 cut-through D Heading in roof coal and tube bundle monitoring lines burnt through	2:27
0106	Longwall crew arrived at 10 cut-through and visibility improved	2:30
0112	<ul style="list-style-type: none"> ▪ QMRS Team 1 leaves the surface to assist with fire fighting. ▪ Longwall crew contacted CRO from 7 cut-through, Main Dips and informed that all were okay 	2:36
0117	QMRS Team 1 arrived at 1 cut-through, B Heading, Main Dips	2:41

		ELAPSED TIME
0127	Longwall crew arrived at B1 cut-through, informed they were in fresh air, removed CABA and directed to proceed to surface in a vehicle	2:51
0136	Longwall crew arrive on surface	3:00
0142	Longwall Deputy arrived at 2 cut-through, B Heading	3:06
0147	Second QMRS mines rescue team 2 arrived on surface (North Goonyella)	3:11
0223	Mines Inspectorate personnel arrived on site	3:47
0225	QMRS Team 1 contacted CRO and informed that fire was starting to be controlled but more men were needed	3:49
0230	QMRS Team 1 contacted CRO and reported that the fire was out	3:53
0300	QMRS Team 3 (mines rescue from Moranbah North) arrives	4:24
0315	QMRS Team 2 leaves the surface to go to the Dips in transport to search for missing contractors	4:39
0330	Roof fall intersection 2 cut-thru and D heading Smoldering fire in fallen roof coal rapidly flares	
0337	QMRS Team 2 encountered smoke at 10 cut-through, B Heading, contacted CRO and were instructed to retreat to FAB	5:01
0403	IMT decided to source high expansion foam generator from North Goonyella	5:27
0435	QMRS Team 3 leaves surface under instruction to prepare site for use of high expansion foam generator	5:59

		ELAPSED TIME
0450	Fire reported as out	6:14
0503	Underground exercise terminated	6:27
0512	Desktop exercise continued to develop search and recovery contingency plan for missing contractors in Main Dips	6:36
0600	Desktop exercise terminated with No contingency to recover missing persons in Main Dips within next 5 hours	7:24
0700	GAG arrived on-site	8:24
1121	GAG ready to start	12:24
1125	GAG engines started	12:44
1138	GAG engine shut down – test successful	

DEFINITIONS

CRO	<i>Control Room Operator</i>
NI	<i>NI Take Off Chute</i>
FRS	<i>First Response Station</i>
MG	<i>MainGate</i>
QFS	<i>Quick Fill Stations</i>
QMRS	<i>Queensland Mines Rescue Service¹</i>

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PART B: THE ASSESSMENT

EMERGENCY INITIATION

CONTROL ROOM OPERATIONS

ASSESSORS : DAVID CLIFF AND BRIAN LYNE

The full potential of the SafeGas software program is not being realised, particularly the facility to incorporate the Emergency Response Process triggers and responses into the computer. This would allow central storage and retrieval of required response actions to be automated generated (saving the need to look for hard-copy manuals). This facility also provides for more accurate document control and maintenance of currency

Additionally, SafeGas can be configured to allow dial in access so personnel (Ventilation Officer, Mine Manager etc) can access system from off-site e.g. Mackay, alleviating delays should they need to come from further afield. SAFEGAS can also have touch-tone phone interrogation from offsite if desired.

Personnel would benefit from increased training and awareness in the capabilities of this software, particularly in

- Trending of gases, especially *Quick Trend*
- SPLUS
- Multiple site analysis and holds on key monitoring locations
- Further understanding of the separate sources of lags and delays in analysis and their cumulative effect

Other Mine Specific Recommendations

- use “*Instruction*” feature of SAFEGAS for TARP implementation and recording of actions
- utilise e-mail system to send information between IMT and CRO
- ergonomics of control room to be reviewed viz. location of DAC, 3 phones and four computers – with three people using these at once, no-one can hear clearly or operate without distraction, increasing risks of error
- review location of types of gas detection equipment underground in light of ability to detect changes in mine gas atmosphere
- was there a succession plan developed, personnel were getting tired
- review tube response times and cycle time – reduce ballast volumes

- efforts appeared too focussed on fighting fire rather than rescuing missing personnel

Common to all exercises held to date - there is still insufficient information being fed back underground in the early stages regarding the status of incident

Good use was made of GC analysis to supplement tube bundle data. The GC functioned accurately for all test samples.

Use of computer based logs of information allows for email of information offsite – clear transmission of information.

Care must be taken in interpreting results based on tube bundle response. Table 1 below shows the various contributions to the time delay between the fire initiating and the tubes alarming. The delay comes in three parts, the delay in the air getting to the sample point, the time taken for the gas to get up the tube and the delay until that tube is selected for analysis.

							Cycle Lag
25/11/00 2309	N3MG 1-2C/T	CO HPV	3	41	20	5	16
25/11/00 2326	D/E Hdg 24C/T	CO HHPV	16	58	30	10	18
25/11/00 2328	E Hdg 24-25C/T	CO HHPV	17	60	30	13	17
25/11/00 2342	E Hdg 23-24C/T	CO HHPV	15	74	30	9	35
25/11/00 2356	N4 A MG	CO HHPV	5	88	45	20	23
25/11/00 2359	N4 A TG 16-17C/T	CO HHPV	11	91	50	24	17
26/11/00 0006	N2 MG B 1-2	CO HHPV	18	98	15	63	20

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CONTROL ROOM – EVENT TIME-LOG
ASSESSORS: DAVID CLIFF AND BRIAN LYNE

			SUGGESTIONS
2221	Received call from Deputy-Main Dips : methane drainage range/water trap has been damaged and is venting methane into the main intakes in the dip.		CRO checked tube bundle readings – high CH4 alarm did not occur in tube 17 until 11:12 due to cycle of tube bundle system and time taken for gas to carry up tube to surface.
2224	CRO rang Deputy back to check whether line was repaired, asked for Section Deputy to take mini-gas reading and to check that all four contractors were present.		Tried to establish methane level in area. Checked mine plan in order to evaluate effect of methane leak.
2228	CRO again rang Deputy to check status and confirm that it was <i>tube bundle line</i> that was damaged – advised by Deputy that it was the <i>methane drainage line</i> that was damaged.		Confusion between drainage line and tube bundle line.
2231	CRO tried to call the Ventilation Officer on his mobile.		Unsuccessful
2233	Rang Underground Mine Manager and advised him of the situation.		Appropriate action in light of inability to contact the Ventilation Officer. Advised that Ventilation Officer was at Glenden. Clear transfer of information and confirmation of actions required by Underground Mine Manager.
2236	Advised of loss of power underground.		
2237	Rang Ventilation Officer in Glenden and advised of loss of power and methane leak.		Clear information transfer and confirmation of actions required by Ventilation Officer.

			SUGGESTIONS
2239	First gas alarm triggered on real time monitors.		A number of alarms occurred in quick succession, considerable issues with acknowledging multiple alarms – required to change screens between AMR and tube-bundle in order to do so
2247	Called Prep Plant for assistance.		
2249	N1 crew deputy rang regarding loss of power underground.		
2252	Tried to contact Main Dips. CO alarms at 50ppm.		Trying to locate missing persons and hazard of methane leakage. Full scale on sensors – recorded information that there was 50 ppm in trunk belt when concentration could have been considerably higher.
2255	Requested N1 Deputy to look for Contractor personnel missing in the Main Dips		Continued to focus on Emergency Response process, trying to locate missing persons.
2257	Smoke advised in N4 Longwall – advised use of SCSR.		
2300	Wash plant help arrived. Put to use answering the phone, and establishing surface security.		Wash plant person appeared not to have formally trained in the roll of back-up controller or his responsibilities other than to answer the phone and write down details of any calls.
2306	Received phone calls from extension 452 but unable to decipher conversation – attempted to call back but received no answer.		Talking to surface from underground whilst wearing mouth-pieces most difficult. Attempts by CRO to initiate non-verbal communication protocol was unsuccessful

			SUGGESTIONS
2309	Report of thick smoke in N3.		
2310	Mine Manager arrives.		Came from Glenden. Incident may have developed differently if Mine Manager had taken another two hours to arrive.
2320	Transformer fire reported.		
2325	Mine Manager gave the call to contact DME Inspector Shane Stephan, Safety Superintendent and mines rescue.		
2330	N1 crew started fighting fire.		
2334	First bag samples collected for GC analysis		Recognition of limits of tube bundle analysers and lag times. Confusion occurred between Graham's ratio and Trickett's ratio – analysis was in error due to GC data being inaccurately recorded
2335	Longwall crew on their way out N1 – fighting the fire		
2339	Mine Manager contacted control to establish an update on missing persons, fire status and contractor personnel evacuation		
2348	Report in from fire site - fire too hot, request more foam. No assistance required – there are six in the area.		
2350	2 x people from underground (contractors Main Dips) arrive on surface. Sent to IMT for de-brief.		
2354	Fire-site seeking advice on whether contractor personnel had reached the surface. DAC only method to contact with fire-site		
2355	Safety superintendent arrived on site.		

			SUGGESTIONS
2356	Gas alarms acknowledged – written on note and sent to IMT.		
2358	Longwall crew deputy and 2 two contractors in main dips still missing. Longwall crew not heard from for an extended time.		
0000	Portal security check – reported no smoke.		
0001	Fire site called Low-expansion foam not working. Seeking mines rescue assistance. Deputy taking gas and temperature readings.		
0005	North Goonyella called: Controller gave an update on mines rescue needed Sending 5 + 3 people – ETA 60 minutes plus. Five men arriving from the mine and three from the village.		
0007	Security portal reported that there was no sign of people exiting the mine or any smoke.		
0011	First miners rescue person arrived – ready to deploy		
0016	Fire-site rang in seeking assistance. There is no progress on fighting the fire.		
0018	Mine Manager contacted Controller on DAC Second mines rescue person arrived		
0020	Mines Rescue Team 1 arrived at fire-site and contacted CRO: 1000ppm in 2 cut-through Suit up crew to fight fire from both sides 2 x teams (3 men in each) Will keep the phone manned.		
0023	Portal security contacted Control and reported that there were no problems.		

			SUGGESTIONS
0031	Tried to contact Fire-site on DAC – not able to.		
0110	Tubes burn through in D Heading Main Dips.		IMT recognised quickly that the tube bundle points were not reading as expected and identified probable cause.
0118	Longwall crew safe at 10 cut-through. Longwall deputy and 2 x contractors from Main Dip still missing.		
0125	Ventilation Officer tried to reprogram SAFEGAS to alter sampling sequence.		IMT trying to focus on areas of interest and improve currency of data.
0135	5 longwall crew on their way to the surface (0137) Mines Rescue team looking to see if fire has spread inbye Moranbah North Mines Rescue Team on their way. ETA 0230.		
0138	Portal No. 2 Security reported no problems Longwall crew arrive in lamp room.		
0145	Phone check made to QAS and Police.		
0202	SIMTARS contacted CRO to check in		
0212	Missing Longwall Deputy arrived on surface – had evacuated via Secondary Escapeway		
0213	DME Inspector John Smith arrived (ex-Mackay) at the Control Room		
0218	MRS Team 1 called to inform the control room that they were getting on top of the fire.		
0223	MRS Team 1 advised that the fire was almost under control and that they needed fresh bodies.		
0230	DME Inspector Shane Stephan suggested DAC used to announce that the fire was out and let people escape if they had barricaded themselves at 27 cut-through area.		

			SUGGESTIONS
0244	Main Headings, 27 cut-through – 0.4 CH ₄ 11100ppm CO 19% O ₂ 0.54% CO ₂		
0330	MRS Team 1 reports that the fire has flared up again, going into fight it. Mines Rescue Team 2 inbye looking for missing contractor personnel		
0334	Message passed to Mine Manager telling IMT of the fire flare up.		
0336	Sent out for extra mines rescue help to fight the fire.		
0338	Called for more low expansion foam.		
0342	5 person CABA team going to fire.		Control room operator kept a good record of names, times and information.
0446	Mines Rescue team 2 returned to FAB, 10 cut-through		
0453	Fire reported as out.		
0503	Underground Exercise terminated.		

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EMERGENCY RESPONSE PLAN AND DUTY CARD SYSTEM

DUTY CARD SUMMARY REPORT

ASSESSOR : NORM GOW

EMERGENCY MANAGEMENT PLAN AND UNDERGROUND EMERGENCY RESPONSE PROCESS MANUAL

The above document defines the required conduct and actions by personnel during an emergency at the mine. The manual uses three (3) interconnected elements to guide persons to determine the most appropriate response. In brief terms, the manual contains a process that includes:

The Underground Emergency Response Process – a flowchart diagram that guides the Control Room Operator through the required initial decision-making process, using references to:

- Trigger Action Response Plans (TARPS)
- Emergency Alarm Level Triggers
- Normal State
- Level 1 Trigger – failure of a TARP process
- Level 2 Trigger – a controllable condition of danger exists
- Level 3 Trigger – an uncontrollable condition of danger exists

Trigger Action Response Plans (TARPS) – are plans that define the required response and actions to identified hazards using an escalating scale as follows:

- Normal State
- Level 1 Response – identify, report and attempt to eliminate cause of abnormal state
- Level 2 Response – identify and report the cause of abnormal state and withdraw all persons to a point of safety
- Level 3 Response – withdraw all persons to a point of safety.

Duty Cards – are cards that define and guide the expected behaviour of critical decision-making during the emergency.

Conformance with the Requirements of the Emergency Response Process

At the time of the first emergency response-triggering event, the Control Room Operator (First Response Coordinator) was the only underground official on the surface at the mine.

On receiving the ruptured methane drainage line report from the Main Dips Section Deputy, the First Response Coordinator (FRC) initiated a Level 1 alarm. Following the underground power trip and whilst receiving telephone inquiries from underground, the FRC experienced multiple gas alarms which caused the FRC to initiate a Level 2 alarm. Smoke entering the Dips and Longwall Sections apparently cause the triggering of a Level 3 alarm from underground.

Effectiveness

The First Response Controller was effective in carrying out his duties despite no referral to either the Emergency Response Process Manual or his duty card.

The provisions of the Emergency Alarm Level Triggers and the pertinent Trigger Action Response Plans appeared to be appropriate for the management of the particular issues that arose with the onset of the emergency.

Comment

A Level 3 alarm was not initiated from the FRC and this may explain why the emergency evacuation alarm was not broadcast and warning “stink gas” released.

The training and / or personal skill of the FRC was highly evident as demonstrated by his conduct in this emergency incident exercise. However, there were some less important FRC duties not carried out, which probably would have been fulfilled in the FRC had referred to his process manual and duty card.

A high level of proficiency in implementing requirements of both the Emergency Alarm Level Triggers and Trigger Action Response Plans was demonstrated by all workgroups underground on the night of the exercise. These workers and management of the mine are to be commended for their knowledge and dedication to the principles of self-escape.

DUTY CARDS

The Duty Cards, together with the Emergency Response Process and the TARPS, form the major part of the “Emergency Response Management Plan and Process Manual”.

The Duty Card system is made up of eight (8) crucial duty cards and six (6) subordinate security duty cards. The nominated duty cards are as follows:

First Response Controller

Backup / External Response Controller

Senior Underground Official on Sites

Surface Security Coordinator

Highwall Dips Area Sentry

Trunk Belt Portal Security Sentry

Surface Muster Area Security Sentry

Car Park Security Sentry

Coal Haul Road Security Sentry

Mine Access Security Sentry

Technical Response Coordinator

Site Rescue Coordinator

External Liaison Coordinator

Senior Emergency Controller

} *These positions are under the control
of the Surface Security Coordinator*

The Duty Card system reflects current emergency response thinking with regard to simplification of duty allocation during mine emergencies. This system also provides for the fact that the mine has a relatively small management team, and therefore, a limited resource to utilise.

Newlands Southern Underground Mine is similar to a number of Central Queensland mines in that often a number of the mine management team ranks are remote from the mine site during weekends. On the night of the emergency exercise a number of persons, who would normally assume duty card roles, were not available for duty due to being remote from the mine site. In fact, on the night of the emergency exercise, the most senior persons underground were the mine Deputies, and on the surface, the Control Room Operator.

A summary of the use of the mine's duty card system on the night of the emergency response incident exercise is as follows:

First Response Controller (FRC)

Conformance with Requirements

With the onset of the initial incident the FRC initiated a Level 1 alarm. As the second and more serious incident symptoms evolved, the FRC apparently commenced initiation of a Level 2 alarm. However, unfolding events underground (smoke in the Dips and Longwall panels) appeared to have overtaken any initiative by the FRC to initiate a Level 3 alarm from his station.

Effectiveness

The FRC appeared to operate effectively, despite being under severe duress and without any assistance or guidance by management, during the early stages of the emergency. Later in the exercise, with backup assistance and the Incident Management Team in place, the FRC's duties became more routine.

Comment

Reference to the process management document during the incident would have assisted in ensuring that all the required actions by the FRC were met. Nonetheless, the FRC deserves commendation for his efforts. Computerisation of the existing emergency response process, using an interactive and user-friendly interface, may have assisted the FRC in meeting all the plan requirements.

Backup / External Response Controller (BRC)

Conformance with Requirements

The BRC commenced duty 39 minutes after the initial incident. Despite no reference to the process management document, the BRC, following eventual briefing by the FRC, met the requirements of the duty card.

Effectiveness

In general terms the BRC appears to have provided effective support to the FRC.

Senior Underground Office on Site (SUOS)

Conformation with Requirements

At the commencement of the emergency incident exercise the position of the Senior Underground Official on Site (SUOS) was filled by the Deputies underground in their districts. This circumstance continued up until the Mine Manager arrived on site some 91 minutes after the commencement of the emergency response incident exercise.

Effectiveness

Evacuation of the mine proceeded reasonably smoothly under difficult conditions despite no separate SUOS being present to provide overall co-ordination.

Comment

Had the Mine Manager been three (3) to four (4) hours away from the mine, instead of the 91 minutes, then the lack of a SUOS may have become a serious impediment in overcoming the emergency situation.

Surface Security Coordinator (SSC)

Conformance with Requirements

The Surface Security Coordinator (SSC) took up his duties 79 minutes after the initiation of the first incident. Shortage of personnel prevented adequate allocation of duties to meet the process requirements. Vacant position requirements were filled as personnel became available.

Effectiveness

Lack of people resources inhibited the effectiveness of the site security arrangements. However, those persons deployed met their duty card requirements and the necessary equipment was available for them to prosecute their duties effectively.

Comment

The mustering point security sentry position was not manned throughout the exercise. This created a potential for problems with the accounting of personnel arriving and departing the muster area.

Technical Response Coordinator (TRC)

Conformance with Requirements

The mine Ventilation Officer apparently assumed the role of the TRC during the emergency exercise. He took up his duties 99 minutes after the commencement of the initial incident. The TRC generally met the requirements of his duty card except the requirement of the card to keep an incident log.

Effectiveness

The TRC appeared to be effective in the discharge of his duties and was a valuable participant in the incident management team.

Comment

Logistical problems in relation to data transfer between the data source and the end users (IMT) resulted in relocation of the IMT closer to the data source.

Site Rescue Coordinator (SRC)

Conformance with Requirements

The Site Rescue Coordinator generally met the requirements of the duty card system.

Effectiveness

The SCR was observed to be generally effective in the prosecution of his duties. No formal risk assessments were observed in relation to establishment of mines rescue operational limitations. Rescue operational plans were developed independently of the Incident Management Team (as per IMT instruction) and then sometimes arbitrarily changed. Some objectives and priorities set by the IMT were not administered as requested. It was apparent towards the latter stages of the exercise that the lack of a formal method to record and update the status and deployment of resources presented an increases impediment to the ongoing control of the Mines Rescue function

Comment

A more structured approach to rescue team operational limits may have provided improved team discipline whilst underground. The integration of rescue team organisational issues into IMT decision-making may have provided improved rescue effectiveness.

External Liaison Coordinator (ELC)

Conformance with Requirements

The role of the ELC was carried out by the Site General Manager. The incumbent generally met the requirements of his duty card except for the maintenance of a log of his actions.

Effectiveness

The duration of the emergency incident exercise did not particularly test the effectiveness of this role.

Senior Emergency Controller (SEC)

Conformance with Requirements

The role of Senior Emergency Controller was carried out by the Mine Manager. The SEC generally met the requirements of his duty card.

Effectiveness

The small size of the Incident Management Team may have placed an excessive work load on that team. Despite this, the team performed admirably during the course of the emergency incident exercise.

Comment

As the exercise proceeded through the night, the onset of team fatigue became apparent. The arrival of mines inspectors appeared to provide renewed impetus within the IMT.

An expanded IMT size may have provided additional support and review capability for the team, thereby lessening the burden on team members.¹

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INCIDENT MANAGEMENT AND EMERGENCY CONTROL

REPORT ON OBSERVATIONS OF IMT

ASSESSORS : GAVIN TAYLOR, MALCOLM SMITH

Introduction

Two assessors were assigned to witness and record the activities of the Incident Management Team (IMT) and to report on their compliance with the Emergency Response Plan as established at Newlands. Further, the assessors were charged with recording the techniques and plans that were effectively utilised to enable those to be shared with the underground industry. Conversely, to identify any shortfalls in the systems that could be communicated to industry to order that steps can be taken to ameliorate the readiness and efficiency of the underground sector in the unlikely event of a major incident.

Formation and Structure of IMT

The IMT was formed shortly after the arrival of the Underground Mine Manager (UMM) [see log detailing event times] and effectively consisted of the UMM and the Ventilation Officer (VO), with assistance from a mining engineer who acted as a general fac totum, until the arrival of the District Inspector of Mines (DIM) some three hours after the team was formed. Upon his arrival the DIM joined the team.

At various times throughout the exercise assistance was afforded the team by the Newlands General Manager (GM) and the Open-cut Registered Manager (OCRM).

Internal Functioning of the Team

There was effective team work between the UMM and the VO. Communication was clear and concise, theories postulated were checked against available data and decisions were objective and discussed with each other before instructions were issued.

It was also evident that all three individuals who initially formed the IMT possessed a thorough and accurate knowledge of the systems established at the mine and the underground workings of the operation.

One has to question the size of the IMT. There is little question that in the early stages of the exercise that their energy levels were high and the thought processes were effective and efficient. However, some 2 to 2 ½ hours into the exercise there was a distinct slowing of the process and a reduction in efficiency. This is not meant as a criticism, as one must appreciate the hour of the day. It was now 2:00am in the morning and most people had been awake for over 18 hours.

The point made was brought into sharp focus on the arrival of the DIM who, even though he may have been awake for a similar period, brought renewed focus and one could sense a tangible lifting of energy within the IMT. Perhaps a slightly larger team would have maintained a more even level of energy.

As stated, the inclusion of the DIM into the team raised the energy level and in a short period of time the functionality of the team was raised to the high standards exhibited in the early hours of the exercise. There was an excellent interface between the DIM and other members of the team with a healthy respect shown for opinions expressed and all thoughts were processed prior to a clear and concise instruction being issued.

Once the report was received that the fire was out the sense of achievement was extremely evident and a detailed focus on the rescue of the missing contractors began immediately. This relief and sense of purpose quickly dissipated on the receipt of the report that the fire had re-ignited.

From this point energy levels, focus and the rationale behind the decision process faltered to a degree and at times erroneous information communicated to the IMT with respect to the coordination of the rescue teams did little to assist.

Overall, it is the opinion of the assessors that the IMT functioned in a thoroughly professional manner and all members deserve high praise for their teamwork, thought processes and the clarity of their instructions.

External Communication to the IMT

In some areas the quality and timeliness of the information provided to the IMT left something to be desired but generally speaking the data was sufficiently accurate to enable the IMT to make objective and correct decisions based on the information provided.

Initially, on the formation of the IMT, a technical oversight on behalf of the assessment team meant that the SafeGas Server was not available in the room designated for utilisation by the IMT. This only momentarily threw the team off stride and to their high credit they were able to improvise to good effect.

The UMM debriefed the first two people to evacuate the mine, two contractors from the main dips. The concise, accurate detail conveyed by the two was of great assistance to the UMM, and high praise is deserved by the contractors on their actions in evacuating the mine in the manner of their verbal report.

The UMM elicited from the contractors the detail required in about eight (8) minutes. The UMM knew what to ask and the contractors provided concise detail. This must be contrasted against the debriefing of the longwall crew where the person detailed to debrief did not fully comprehend what detail was required.

There were insufficient personnel to carry out effectively all the functions required by the Duty Card System. The debriefing of evacuees is but one example and the personnel who have escaped the mine must have an effective debrief. The knowledge they possess could be vital to the IMT.

The assistance provided by the Newlands GM was excellent. He permitted the UMM to focus all his attention to the tasks at hand and was available at all times to assist with external matters that required attention but were not directly related to the events unfolding below ground.

At times the accuracy and timeliness of information flowing from the control room was suspect. To his credit, the UMM, when in doubt, did not accept crucial information on face value. If there was doubt – he walked to the control room, some 15 meters from his temporary IMT office and checked for himself. It would have been less of a task had the nominated IMT room been in use as there was direct DAC communication available.

The major area of concern to the auditors was the accuracy and timeliness of information flowing to the IMT with respect to most aspects relating to the Mines Rescue teams on standby and in eventual operation at the mine. It is, in our opinion, vital that the IMT controls all aspects of the operation and they must be provided with accurate detail, and in turn, their directions to be fully complied with.

This did not always occur and it necessitated the UMM moving to the rescue room to retrieve the situation at one point.

Overall there are some areas of minor improvement required. Those areas can be readily addressed by personnel ensuring accurate and timely communication to the IMT to permit that body to make accurate and objective decisions.

Positive Points Noted by the IMT Assessors

- The positive attitude by all Newlands personnel we dealt with. Everyone wanted to gain something from this exercise and make Newlands a safer and more efficient mine.
- The availability in a plan folder of all relevant plans that may be required in an emergency. All the plans were plasticised which permitted detail to be recorded and removed as the scenario altered.
- The effective utilisation of the in-seam First Response Teams utilising the CABA system. Something the whole industry can learn from.
- The knowledge of Newlands systems by not only permanent employees but also the contractors involved
- The utilisation of “blind man” sticks to aid evacuation in impaired visibility.
- The high standard of front line supervisors below ground during the exercise. Their expertise and control of exercise scenarios deserve high praise.
- The foresight of the contractors in the main dips in what very quickly became an irrespirable atmosphere to provide compressed air into cardboard hoods to provide a life saving atmosphere.

Areas for Improvement

- More and frequent simulated exercises in atmospheres of impaired vision. Everyone in the industry should be exposed to this scenario.

- Ensure the number and balance of the IMT is correct. This is by no means a criticism of the Newlands team who performed admirably. It is more a question of fatigue and how long a team should remain constituted until relieved.
- Trained personnel available to debrief persons after they evacuate the mine. The knowledge evacuees have is vital to the IMT.
- Ensure key personnel can be contacted at all times. The location of the VO was incorrectly logged and it was only when the UMM was contacted that the Control Room Officer became aware of the VO's location.
- Whilst Newlands have an excellent system to record the names and locations of personnel below ground some personnel when they evacuated the mine did not relocate their tags and this caused a little confusion for a short period.
- All personnel must remove tags or replace lamps, dependent on the system of accounting for personnel when they are safely on the surface.
- At one point the contact numbers of persons to be notified in case of emergency for the contractors still underground was discussed and how they could be acquired. If the contractor log books had been in use at Newlands, as had previously been agreed to by all underground mines, the details would have been readily available in those books.
- Develop a card system whereby sufficient trained personnel are available to conduct the tasks required by the Duty Card List.¹

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INCIDENT MANAGEMENT TEAM (SURFACE CONTROL) – EVENT TIME-LOG

ASSESSORS: GAVIN TAYLOR, MALCOLM SMITH

			SUGGESTIONS
2221	Phone call from underground to surface control room to initiate the emergency – 22:13 ruptured CH4 drainage line main dips.		
2230	Only surface controller on surface.		
2233	Controller contacted manager re: CH4 damage. Rupture in drainage line - 27 cut-through, Main Dips Tried to call ventilation engineer in.		Ensure that key personnel can be contacted at all times. The location of the Ventilation Officer was incorrectly logged and it was only when the UMM was contacted that the Control Room Officer became aware of the Ventilation Officer's location.
2235	Controller advised that underground power had just tripped off.		
2236	Controller to Ventilation Officer – methane drainage problem.		
2238	Alarm 1 in control room, tube bundle system location. Ventilation Officer coming to the mine. Alarm 2 Alarm 3 Alarm 4 Alarm 5 – called prep plant for assistance. Alarm 6	Ensure the number and balance of the IMT is correct. This is by no means a criticism of the Newlands Team who performed admirably. It is more a question of fatigue and how long a team should remain constituted until relieved.	The availability in a plan folder of all relevant plans that may be required in an emergency was an excellent initiative. All the plans were plasticised which permitted detail to be recorded and removed as the scenario altered.

			SUGGESTIONS
2248	Call from underground regarding power – “get Deputy to call me”		
2249	CRO checking all the alarms at this point.	They had risen from 5ppm to 50ppm down the main roadways with multiple points alarming. At this stage the TARP’s did not require an evacuation although the TARP’s only really deal with one sample point - not for multiple sample points alarming.	Review TARP’s to determine whether a low level alarm at multiple sample points should escalate the actions required, even to the level of immediate evacuation.
2252	50ppm truck belt boot end. Go and check on men in dip headings.		
2255	Called Longwall – 50ppm at boot end. Put self rescuers on and go to crib room and FRS.		The effective utilisation of their First Response Team utilising the CABA system. Something the whole industry can learn from.
2300	Prep Plant Operator arrived to assist Controller and was instructed on the process for phones and callout procedure. 1 x Control Point 1 (Portal) was established.	The person allocated to the Control Point 1 followed the task sheet and this was very well completed. The person allocated as back up response controller had no prompt sheet and was not sure what to do until the CRO could find some time to advise him.	The system used for the site security, their prompt sheets, ID jackets and protocols were excellent and worked very smoothly. A back up response controller prompt sheet should be developed.
2303	Control to 106 for assistance. Asked who? – was told that anybody with two legs and can walk will do. Dispatched to monitor portal and trunk belt portal.		

				SUGGESTIONS
2305	Telephone problems call from underground Longwall.			The CRO recognised that some-one was talking with a mouth-piece in and attempted non-verbal protocol. However, due to the pressures of time, the u/ground crew hung-up, started evacuation and didn't answer the phone when the CRO rang back.. This lead the CRO to incorrectly believe that the u/ground telephone system was off-line
2313	Manager on site – saw CRO for information and further information on gas readings.			
2317	Assistance arrived – Ventilation Officer and emergency controller discussion.		Ensure key personnel can be contacted at all times. The location of the Ventilation Officer was incorrectly logged and it was only when the Underground Mine Manager was contacted that the CRO became aware of the Ventilation Officer's location.	Good knowledge of Newlands Systems by not only permanent employees but also the contractors involved.
2322	Fire reported.			

				SUGGESTIONS
2335	<p>Runner with information from Surface Controller. Talked with surface controller regarding information to date and location of underground personnel.</p> <p>Ventilation Officer to speak with manager regarding personnel, location and activity.</p> <p>Manager notified to set up in the normal emergency control room.</p>	<p>UMM talked with CRO regarding information to date and location of underground personnel. Ventilation Officer discussed with UMM underground personnel, location and activity.</p>		
2340	<p>Surface controller – fire location and trying to fight fire, location of dips personnel.</p> <p>Longwall personnel and deputy - all personnel identified and who was missing</p> <p>Location and direction of smoke?</p>	<p>Whilst Newlands have an excellent system to record the names and locations of personnel below ground, some personnel when they evacuated the mine did not relocate their tags and this caused a little confusion for a short period.</p> <p>All personnel must remove their tags or replace lamps, dependent on the system of accounting for personnel when they are safely on the surface.</p>		<p>The utilisation of “blind man” sticks to aid evacuation in impaired visibility was good.</p>
2345	<p>Ventilation Officer to gather information and CH4 trend make for Manager to reference.</p>	<p>Computer print problems only half screen, had to hand write other information.</p> <p>111 – 12 through to 20.</p>		

			SUGGESTIONS
2347	Manager commenced to put information up on the white board in IMT.	There was no pre-established layout for this task. The manager was trying to put the events into a timing sequence as well as collect data and focus on the problem.	The emergency white board in IMT could be pre-laid out with main headings that can be used as prompts, e.g.. Priorities, factual data, assumed data (to be confirmed and how), gas readings (trend), last known location of underground personnel, actions taken and contingency planning (who and what).
2348	Two Dips Contractors arrived on surface.	Both were not sure where to go or who to see once they arrived. CRO advised manager that they were on the surface and the manager requested that they come to IMT for a de-briefing. Details of the last place the other two workers were seen were confirmed. After de-briefing, they were both allocated to surface security functions by the manager.	At this stage a number of mines middle management were arriving. The critical position of Surface Controller should have been allocated. This role allocates and coordinates all of the surface roles, directs persons from underground to de-briefing areas and liaisons with IMT. This position is critical in removing distractions from IMT and gives them one communication point for surface based information or tasks.
2355	Mines Rescue Coordinator (MRC) in IMT made no comments and left.		
2356	Emergency Controller interviews two men from dips.		

			SUGGESTIONS
0000	Ventilation Officer – gas analysis information IMT. Determine where CH4 line is broken. Discussion regarding missing men and last known location and conditions of vent via information from two men who evacuated.	At one point the contact numbers of persons to be notified in case of emergency for the contractors still underground was discussed and how they could be acquired. If the contractor log books had been in use at Newlands, as had previously been agreed to by all underground coal mines, the details would have been readily available in those books.	The high standard of front line supervisors below ground during the exercise. Their expertise and control of exercise scenarios deserve high praise.
0004	MRC information regarding MR trainees available. Men and location MRC to check – I am not sure how many men are underground. Greg R briefed regarding men and location to Emergency Controller.		
0006	Control regarding MRC and North Goonyella MRT available. Five underground and two from village camp. Discussion briefed MRC on activity, develop scenario fire fighting actual fire extent. CH4 problem. MRT recommence focus on CABA to extinguish fire. Directed to mobilise GAG (GR)		
0015			

			SUGGESTIONS
0018	<p>Considering fresh personnel by early morning – 8:00am.</p> <p>IMT – two people man / ventilation officer</p> <p>Call SIMTARS</p> <p>Outside resources</p> <p>Camp and meals</p>		<p>Ensure that the number and balance of the IMT is correct. This is by no means a criticism of the Newlands Team who performed admirably. It is more a question of fatigue and how long a team should remain constituted until relieved.</p>
0025	<p>Manager – how many personnel underground and their location?</p> <p>Manager called Mackay Inspectorate</p> <p>MRT being mobilised from Glenden and North Goonyella and QMRS.</p> <p>General Manager reported on activity.</p>		
0035	<p>Ventilation Officer spoke with SIMTARS regarding support.</p> <p>CH4 make and completion from trend from fire.</p> <p>Missing men consisted of two contractors and deputy and five men from the longwall could be and location and ventilation change or reduction.</p> <p>Asked Ventilation Officer to see MRC to a report on what was happening.</p>		
0040	<p>MRC – update MRT to assist fire fighting scenario.</p> <p>FAB location at 8 cut-through, one five man team ready, location of personnel – where will they be?</p>		
0059	<p>Manager checking gas levels and trends.</p>		
0103	<p>MRC - can't get close to the fire.</p> <p>Need more men, send more men to the fire area but make sure there is someone on the DAC. We are not into a rescue situation! No concern of the missing men during this conversation.</p>		

			SUGGESTIONS
0105	Manager had discussions with the Ventilation Officer of gas trends. Dropped off sampling points – contact SIMTARS		
0111	Manager – discussion regarding missing and next of kin concerns, house in Glenden , HR representative to call the people to see if they are available – calls would come through control – divert the calls.		
0115	Manager – notification of five longwall at 10 cut-through. Name of men / go to 8 cut-through / and to service. Discussion MRC on what to do regarding ventilation. Pogo sticks, brattice at 10 cut-through.		
0120	Manager checking underground tag board – not sure of underground personnel location. Trends to be checked by SIMTARS		
0125	Manager, MRC checked to see what the status is with teams. Discussed with Manager.		
0140	Longwall crew out. Manager directed to put gear in rescue room and to take a rest.		
0142	Manager called to brief Inspectors on situation. SIMTARS, prep mobile lab for mobilisation. Police and medics notified.		
0145	North Goonyella mines rescue team arrive.		
0150	MRC report to Manager. Team can only get to 20 meters – hot and smoke – discussion long time and samples tube seems to be ruptured.		
0206	Gas analysis trying to validate by bag samples discussion.		

			SUGGESTIONS
0210	<p>Manager met North Goonyella team.</p> <p>Ventilation Officer regarding bag samples and trend reference tube samples must be severed.</p> <p>Discussion – 30 minutes long time.</p> <p>MRC – discussion on debrief of men.</p> <p>North Goonyella team on way out.</p>		
0215	<p>Longwall Deputy arrived on surface (via secondary escapeway) and debriefed.</p>		
0215	<p>DME Inspector arrived.</p> <p>Two contractors still missing.</p> <p>Water on fire for 3 hours, cut-thru 2 – MRT in D Heading</p> <p>Manager – how long are the men in the area?</p> <p>Manager – how long to build segregation stopping come back?</p> <p>Manager – no one inbye until fire is under control, checking as samples.</p>		
0224	<p>Handling fire - seems to be under control, can we move to the other cut-through and try from this side?</p>		
0225	<p>Gas samples being analysed.</p> <p>Two contractors still missing.</p>		
0230	<p>DME Inspector (Mines) arrived and briefed by the Manager</p> <p>MRC reported that fire was out.</p> <p>Manager – QMRS ETA 3:00am – anyone at Dysart Station? Yes.</p> <p>Before we send anyone in irrespirable we need to do a risk assessment and establish FAB.</p> <p>Need to maintain a fire crew</p>		

			SUGGESTIONS
0235	<p>DME Inspector briefed on samples tubes reports Bag sample from shaft.</p> <p>Do we have DAC capability along the belt?</p> <p>Broadcast by DAC message that the fire is out and the rescue team is on its way – stay put.</p> <p>Make sure compressors keep running.</p> <p>Shane Stephan – CH4 anyone check stack? Medical assistance etc.</p> <p>Discussion on de-briefing notes from evacuees, contractors knowledge, MRT response – vehicle, mine teams need to be replaced.</p> <p>Time to clear mine of smoke and gases is 10 minutes. What about residual i.e. cut-thrus etc.</p>		
0250	Ventilation Officer information passed onto MRC.		
0251	<p>Manager – MRT briefing of situation.</p> <p>Gas readings given.</p> <p>Search and rescue process. Vehicles?</p> <p>Travel MRT – advance FAB communications!</p>		
0300	<p>Moranbah MRT arrived.</p> <p>DME Inspector – roof support around the fire, go to talk with Manager</p> <p>Ventilation Officer checking gas samples and analysing.</p> <p>MRT changing in rescue room – someone should be delegated to look after each team from other mines.</p>		
0310	Manager debriefed fire team – gathering information regarding the condition of the area.		
0320	<p>Manager – continue to take samples.</p> <p>DME Inspector – availability of electrician for telephones and repair to cable.</p>		IMT still of mistaken belief that the underground phones are out of order

			SUGGESTIONS
0323	Possible water build-up stoppings – flooding, areas for quarantined. DME investigation Team and process.		
0325	Ventilation Officer samples and interpretation Food arrives.		First refreshment since Emergency Started
0330	Manager notification of next of kin. Ground control fire area – stability		
0338	Fire flared up - Manager: where is MRT? How to extinguish the fire – high expansion turbex generator.		
0340	Ventilation Officer checking gas samples and analyse lag time. (No one available to take log recorder notes – only Manager, who is taking IMT notes, decision making and results).		
0345	High expansion foam generator is inbye, open-cut may have some boiler capability can we use this flexible hose open-cut. DISCUSSION Who is available to run the boiler, who is on site. Blair Athol? Low expansion foam – surface truck. Manager – what caused the power to go off. The power is off.		
0352	High expansion foam – surface mine! DME Inspector instructed team not to go into the foam due to unknown roof conditions.		

			SUGGESTIONS
0410	<p>General discussions - Fire and option to extinguish.</p> <p>High expansion – turbex.</p> <p>How to reach a decision on what to do – process of elimination.</p> <p>Turbex generator capability? Not considered. Discussion?</p>		
0425	<p>Manager briefed Moranbah North Team regarding ventilation change to allow for foam to be effective. Stoppings B1 and C2.</p> <p>Foam generator cut, Q's water pressure/quantity availability.</p> <p>Hydrant location.</p> <p>Four CABA and quick fill station.</p> <p>Six BG's</p> <p>Communication – DAC</p>		
0440	<p>Team mobilised – communicate when first screen is up.</p>		
0447	<p>Fire reported under control.</p> <p>Manager – continue with plan of action identified.</p> <p>Discussions on plan to locate and retrieve missing persons Brief team issue under O2 without a standby team.</p> <p>Briefing held in MR room.</p> <p>QMRS – cannot go in irrespirable without a backup team, even to rescue missing persons. Issue – CABA can be used to fight fire</p> <p>Advised that the fire is out – no change, no search & rescue</p>		
0455	<p>QMRS Team deployed to prepare fire-site for high expansion foam.</p>		

			SUGGESTIONS
0503	<p>Underground Exercise terminated.</p> <p>Tabletop wrap up and action plan to recover two missing contractors.</p> <p>Fill 2 cut-through with foam to control fire zone.</p> <p>than, reinstall telephone system</p> <p>than, restore ventilation to Fresh Air</p> <p>than, begin search and rescue – once found, aided rescue</p> <p>Estimated time till begin search 6-7 hours</p>		
0600	<p>Desktop exercise terminated</p>		

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EMERGENCY EVACUATION

N1 DEVELOPMENT PANEL

EVACUATION AND IN-SEAM INTERVENTION – EVENT TIME-LOG

ASSESSORS: GREG DALLISTON AND NORM GOW

		ACTION DETAILED COMMENTS
2236	Informed crew (which consisted of Deputy and 5 miners) that the power had just tripped. <i>Deputy and miners continued to secured roof and machine with the okay from the assessor</i> Car driver contacted control to find out about reason for power loss – told tube bundle line damaged at 27 cut-through.	It was in fact a damaged methane drainage line
2248	Face and machine secure and crew making its way to the crib room.	
2253	Control contacted Deputy. Information given was that all power was off at the mine. Deputy reported that all N1 men were okay. There was 50ppm CO trunk belt boot and the two contractors down in the dips had not been heard from for awhile.	
2257	Deputy and 1 crew member going to leave N2 – Rang control to report this, stated that there was no smoke or gas to report. Control reported that >50ppm all over pump station T2 loop. Deputy re-assessed, took decided to take the crew in search of the missing contractors in the Main Dips	
2302	Crew left panel and went inbye to search for the missing contractors	
2305	High CO levels and smoke at 10 cut-through, Main Dips (entry N3) stopped progress inbye. Checked belt road and found smoke. The crew turned around and retreated outbye and left the cache for the longwall crew.	

		ACTION DETAILED COMMENTS
2308	Reported to control that there was dense smoke down the belt road. Electrician believes that the transformer has blown up at N2 Maingate, 6 cut-through.	
2318	Deputy established that the fire was at the transformer. Talked to crew and asked them if they wanted to retreat to the surface or fight the fire using FRS. EIMCO driver dispatched back to N1 panel to pick up First Response Station	
2320	Rang control and informed them that: All six men were okay, the roof and the ribs were on fire and that they intending to try to put the fire out and have FRS from the panel. Asked control to ensure that all power was off and tagged out so that it cannot be re-started.	
2322	EIMCO arrived with FRS.	
2328	Identified water on fog and nozzle. One man on hydrant and one on hose.	
2330	Four men suited up and hose was run. 1 suit < 100 so it was refilled at QRS.	
2348	Deputy told crew member to ring control and inform them that low expansion foam was going to be used and that the fire was too hot and they were making no headway.	
2350	Report back from phone call stated that there had been no contact from the longwall crew and no contact from the dips. Mines Rescue had been called.	
2353	Deputy stationed a person on DAC to tell him if there was any word from the longwall and dips crews.	
0000	No ETA on QMRS. No word on inbye men Surface Safety Superintendent contacted asking if they were keeping a record of gas and temperature readings. Inbye of 2 cut-through, C → D Headings – CO off-scale.	

		ACTION DETAILED COMMENTS
0006	<p>Not enough men to fight the fire.</p> <p>Deputy took with him a watch person and took readings down D Heading:</p> <p>1 cut-through clear, 1 → 2 cut-through off scale > 1000ppm</p> <p>Decided to run hoses down D Heading</p>	
0015	<p>Deputy reported back to crew and decided to use the other CABA units from 8 cut-through Portal Dips FRS.</p> <p>Also decided to use two lots of men to fight the fire on two fronts</p>	
0036	<p>Deputy contacted control on the DAC:</p> <p>Will set up FAB at 8 cut-through, Portal Dips at FRS.</p> <p>Still 3 men fighting the fire at C Heading and two men setting up hoses and D Heading.</p> <p>Set up rotation of workers - spare person to sit in the corner of B Heading to rest</p>	
0056	<p>Deputy contacted control via DAC:</p> <p>QMRS are on the surface and getting ready to leave.</p> <p>No news on the longwall or dips crews.</p> <p>No making any headway with the fire.</p> <p>Deputy asked for more men to be able to fight the fire from two sides.</p>	
0117	<p>QMRS Team 1 arrived – briefed by Deputy:</p> <p>3 men were in the belt road with the fog and jet.</p> <p>Atmosphere inbye 1 cut-through > 1000ppm CO.</p> <p>Extreme heat in C to D Heading, 2 cut-through.</p> <p>QMRS Team 1 suited up with CABA (leaving BGI74s in rib)</p> <p>QMRS Captain asked Deputy to contact CRO and inform that they would try to get around the bottom of the fire from 3 cut-through.</p>	
0125	<p>Sentry reported that approximately 6 men were coming up B Heading, Main Dips.</p>	

		ACTION DETAILED COMMENTS
0137	No visibility in C Heading, 3 cut-through, CO off scale, extreme temperatures. Two members went in search of missing crews and one team member waited.	
0141	Search party reported back to Deputy and Captain QMRS Team 1. Discussions on who was still not accounted for and when was back-up turning up. <i>Information given at this time was that roof coal was on fire at 2 cut-through, D Heading but hasn't yet extended into C Heading.</i>	
0142	Deputy made the decision to attack the fire in C to D Heading and they would probably be able to get it under control. Estimated that in 15 – 20 minutes the fire would be under control.	
0215	<i>FAB : Set up approximately 2 pillars from fire site, two FAB officials and FAB fully equipped. No standby team. Were Mines Rescue Guidelines considered / observed?</i>	
0220	An air reading was taken by a QMRS member.	
0230	<i>Reported to QMRS Team 1 Captain that the fire was under control</i>	
0237	Instructions received from control were to leave three men to monitor the fire and the rest of the team was to wait there.	
0325	QMRS Team 2 arrived at the fire site uncoupled, proceeded inbye down B hdg in vehicle uncoupled. 5ppm CO at 3 cut-thru 8ppm CO at 6 cut-thru 10ppm CO at 8 cut-thru	
0334	9 cut-through, B Heading, 30ppm CO, light smoke. Team to decided to suit up – only 3 suits in vehicle, others left at FAB Send vehicle back for other suits	

		ACTION DETAILED COMMENTS
0336	CO increasing to 50ppm, 10ppm at 6 cut-through – smoke getting thicker Team moves outbye and returns to fire-site to find that the fire has re-started	
0339	Contacted control room to inform them that the fire had flared, smoke made it difficult to identify exact source	
0350	QMRS Team 3 arrive at 1 cut-through, C Heading Briefing provided by member of QMRS Team 1	QMRS Team 3 Captain had no mine plan
0352	Check O2 level Move into D Heading, 1 cut-through and down D Heading to locate and fight fire at source. Use fog nozzle and move in until more foam arrives.	
0400	15 meters outbye, 2 cut-through – 150ppm Inbye 2 cut-through, D Heading – 850ppm <i>Information provided</i> <i>Intersection roof in D Heading, 2 cut-through has collapsed and is ablaze</i>	
0420	Fighting fire from D and C Headings	
0440	Relief Team at D Heading (4 men)	
0449	Relief Team at C Heading (4 men)	
0450	FIRE OUT	

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N4 LONGWALL PANEL

LONGWALL 4 → N4A PANEL

ASSESSORS: MURRAY WOOD, PETER BAKER AND NEVILLE KATHAGE

The Longwall personnel involved in the emergency exercise and evacuation conducted themselves professionally and in a manner that brought reality to the exercise. With the exception of the Longwall Deputy, who was separated from the crew intentionally, all personnel evacuated the longwall panel to safety. Recommendations from the exercise relate to the areas of communication, training, escape equipment, CABA facilities and layout, CABA maintenance and underground demarcation. Detailed recommendations appear in the following Assessment tool.

The framework of an effective emergency response and escape system was evident. The recommendations made serve only to improve this system.

The assessors arrived at 20 cut-through, Longwall N4 at approximately 9:55pm. On arrival, Murray Wood proceeded to the Maingate and contacted the Deputy. Due to poor roof conditions along the longwall face, continuous production was required to be maintained. Accordingly services and personnel for this were not involved in the emergency exercise.

The five people participating in the exercise were at the Maingate. Three were regular longwall crew members and two had been seconded from Maingate N1 development panel for the exercise.

Assessor Murray Wood briefed the Deputy on the general format of the incident. At approximately 10:30pm the Maingate personnel stopped the Longwall N4 conveyor to remove belt structure and rollers. On completion of this task the emergency exercise commenced.¹

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LONGWALL → N4A PANEL – EVENT TIME-LOG
 ASSESSORS: MURRAY WOOD, PETER BAKER AND NEVILLE KATHAGE

			SUGGESTIONS
2241	Longwall N4 Maingate personnel completed removing belt structure. Exercise assessor handed first instruction to participants notifying them that the power had tripped and that the ventilation remained unchanged. The assessors informed the group that Deputy had gone to the tailgate to inspect Longwall N4 take-off chute. There was a brief discussion on action to be taken with the decision to ring the Control Room from the crib camp phone.	All members of the group participated in the discussions.	
2245	Crew rang Control and was notified that a methane drainage line had been broken at B27 – C27 Main Dips and that the power had tripped to the pit for reasons unknown. Control said that the situation would be investigated and the personnel would be notified as to what was happening.		
2250	The group decided to contact the Deputy and attempted this via the DAC. At this stage they were informed that the Deputy was still in the tailgate inspecting the take-off chute. The group decided that two persons should proceed to the tailgate and inform the Deputy of the situation.	Decision to contact the Deputy and advise of the situation.	
2253	2 crew proceeded toward the tailgate to find the Deputy. 2 crew remained at the boot while 1 crew attended the crib camp phone for a return phone call.		
2255	Control called via the DAC to inform longwall face personnel that 50ppm CO had been detected at the trunk belt boot end.		

			SUGGESTIONS
2257	<p>Notice handed to 2 crew searching for deputy advising them that smoke was progressing into the panel and was entering the face area. They decided to don their belt worn SCSR units, which was confirmed as appropriate by the assessor. At the maingate the other 3 crew personnel were given the same notice upon which they donned their belt worn SCSR's and proceeded to the crib camp.</p>	<p>Immediate decision to don rescuers.</p>	
2259	<p>Belt worn SCSR's donned – donning time between 20 seconds and 1 minute. 2 crew searching for deputy returned along the longwall face to the maingate and out to the crib camp.</p>	<p>Time to don self-rescuers ranged between 20 seconds and 1 minute. Donning of rescuers carried out effectively.</p>	
2303	<p>At the crib camp, 3 crew decided to wait for other 2 crew. They arrived at the crib camp and joined the three other persons there. 1 crew was on the phone to Control. The decision was made by the group to proceed to the first response station.</p>	<p>Could not establish effective communication with the SCSR being worn but did write down a message.</p>	<p>System for non-verbal communication protocols requires to be well known and rehearsed. Emergency number not used – control number preferred – this should be reexamined.</p>
2306	<p>Personnel with SCSR's donned proceeded outbye to the first response station. The group linked hands to ensure the members of the group were accounted for. <i>At 19 cut-through, Assessor Peter Baker informed the group that smoke was travelling down Longwall N3 face in addition to the Longwall N4 intakes.</i></p>		

			SUGGESTIONS
2308	<p>Arrived at first response station (FRS) outbye 19 cut-through and changed to CABA – CABA on back with belt worn SCSR’s still fitted. Changeover to CABA mask effected within 15 seconds of removing the Oxybok mouthpiece. The group picked up the buddy masks, one of which was used to buddy C B to GB. They also knitted out with blind man sticks and a 60 minute Fenzy SCSR each. Determined from group members at surface de-briefing – CABA pressures (bar) – DW 220, RD 230, PM 250, GB 230.</p>	<p>No evidence of discussion to decide who wore CABA and who “buddied” up – “first in – best dressed”. Was not certain what pre-start checks were made – pressures were checked, warning whistle checked on two units. No evidence that one minute leak test was carried out. Did not check both CABA cylinders were turned on (important later as the possible cause of the early exhaustion of CABA units)</p>	<p>Access and storage of CABA’s could be improved to enable easier donning of the units. (Comment from people that original storage that allowed the unit to be lifted and put on over the head was better than present storage). Review number of CABA units and accessories (buddy masks). Review pre-start checks – is the one minute high pressure leak test necessary? Valving arrangements for CABA’s to be reviewed – a single valve to turn both cylinders on is suggested to remove the risk of only turning one cylinder on. Training on CABA’s to include oxygen cylinder use philosophy – turn one on, when warning whistle sounds turn the other on (as used in search and rescue).</p>
2314	<p>CB rang Control and informed that there was no Deputy present, the number of people in the group, poor visibility and the intended route of travel.</p>	<p>No information from Control on the location of the incident.</p>	<p>Protocol be developed for information transfer in an emergency – should prompt any user in the important points to be communicated.</p>

				SUGGESTIONS
2315	<i>Assessors stopped group and outfitted masks with reduced visibility facilities.</i>			Emergency exercise preparation prior to an exercise is critical. Where possible alterations to facilities in advance of the people reaching those facilities.
2324	Departed FRS and proceeded outbye along block side rib. The group used their blind man sticks on ribs and pipes to determine route of travel.		<p>Good use of blind man sticks to determine route of travel.</p> <p>Separation of members occurred though this was controlled by good communication and use of hands and blind man sticks to link together.</p>	<p>Link-line between members of the group would prevent separation of members. Link-line would need to consider distance between members e.g.. Buddy mask line is a limiter. A life-line would facilitate escape speed and route.</p>
2328	Arrived at 18 cut-through. CB (using a buddy mask and mine rescue trained) did a lot of talking whilst walking.		<p>Note that power was on underground and the group could hear the longwall pump station and lights were on.</p> <p>Communication used effectively to keep group spirits up, check on people's condition and position, discuss options when CABA exhausted and what the problem could be outbye.</p>	<p>Emergency escape training should include material on effective communication and methods.</p>

				SUGGESTIONS
2332	Arrived at 17 cut-through. Stopped and checked how people were (this was a regular occurrence). Phone in cut-through not identified.		Phone at 17 cut-through not identified.	Indication required at cut-thrus (both sides and ribs) to identify escape facilities such as telephone, DAC and caches. Suggest that only two levels of demarcation / indication be used – one for communications and one for escape apparatus.
2335	Arrived at 16 cut-through.			
2337	Arrived at 15 cut-through. Noted that ventilation was okay. Phone not identified.			
2340	Arrived at 14 cut-through. Inquiry from member of the group as to their location.			
2343	Arrived at 13 cut-through.			
2345	Arrived at 12 cut-through.			
2346	Arrived at 11 cut-through.			
2347	Arrived at 10 cut-through.			
2349	Arrived at 9 cut-through. SCSR cache (25 units) in 9 cut-through not identified or recognised. Checked group's condition. PM CABA pressure 170 bar. Outbye of 9 cut-through PM advised team to watch out for droppers.		Signs at the cut-through were not identified and, in the visibility conditions at the time, were of no benefit.	

				SUGGESTIONS
2352	Arrived at 8 cut-through.		870 meters traveled in 28 minutes – good roadway conditions – equivalent to 1.9 km/hr.	
2353	<p>Outbye 8 cut-through, first warning whistle sounded on RD's CABA. Group stopped and buddy mask was set up on DW's CABA with the intention for RD to buddy with DW.</p> <p>On operating the buddy mask, the purge (free flow) operated continuously and could not be stopped. RD attempted to rectify then decided to don his 60 minutes Fenzy SCSR.</p> <p>CABA pressures (bar) – RD 55, GB 80, DW 110, PM 150.</p>		<p>RD's CABA lasted approximately 30 minutes – it is possible that only one CABA cylinder had been turned on .</p> <p>Why was the spare buddy mask used – could have disconnected one mask line and plugged into others suit without having to remove his mask or using the spare buddy mask.</p> <p>The spare buddy mask was faulty. This unexpected problem with the spare buddy mask is a potential risk in any situation.</p>	<p>Review CABA training to ensure contingency actions are known and rehearsed. This should cater always for the unexpected.</p> <p>Review maintenance program to ensure that CABA's are maintained in a state of operational readiness – the program should meet, as a minimum, manufacturer's recommendations.</p> <p>Back-up facilities to any escape system / apparatus are required in the event of equipment failure.</p>
2359	Continued evacuating outbye – DW leading.			
2400	<p>Warning whistle sounded on GB's CABA (had CB on as buddy). CB unplugged and plugged into DW's CABA – this changeover effected in < 10 seconds.</p> <p>Decision by GB not to go to SCSR but to continue with the warning whistle sounding – readied SCSR by taking off lid and extending mouthpiece tube.</p>		<p>CB's changeover of the buddy mask was excellent.</p> <p>Three warning whistles sounding at one stage – noise was distracting.</p>	<p>Review protocols on action taken when CABA warning whistles are activated – preferred options require identifying and actioning.</p> <p>Recommend suits be turned off to disable warning whistle when the CABA is not in use.</p>
0001	Continued evacuating outbye.			
0002	Arrived at 7 cut-through.			

				SUGGESTIONS
0004	Warning whistle sounded on DW's CABA. CB (buddy) changed to 60 minute Fenzy SCSR. CABA pressures (bar) – DW 50, GB 40, PM 130. Group discussed location of next cache and moving to pillar side rib so as to detect droppers.	Change to the 60 minute SCSR was quick and effective.	Demarcation of SCSR caches is required each side of the cut-through entry – current levels of demarcation should be reviewed.	
0008	DW went to Fenzy SCSR – had difficulty with changeover as he did not put head-strap on first. Removed mouthpiece to fit head-strap.	Difficulty with changeover would not have placed the wearer in a life threatening situation.		
0013	Continued evacuating outbye. Moved to pillar side rib to ensure droppers for next SCSR cache would be detected.			
0015	Arrived at 6 cut-through. DW Fenzy SCSR was on back-to-front. He walked to the stopping in the cut-through and took the mouthpiece out and reversed the Fenzy SCSR.		Personnel should be made aware in SCSR training of the importance of changeover between apparatus and the risks associated with this. Practical training should also address this issue.	
0019	Proceeding 6 cut-through → 5 cut-through, confusion as the grade changed and group members queried whether they were going the right way. Continued evacuating outbye.			
0022	Arrived at 5 cut-through.			
0024	GB changed to 60 minute Fenzy SCSR. He had previously readied the unit.	GB had maximised the use of his CABA – no oxygen left.		
0026	Arrived at 4 cut-through. Some confusion negotiating across cut-through. Group checked condition of team members. One member requested spare Fenzy.	CB carrying spare Fenzy on each request he would bang the case, however this was not recognised by the team.	Non-verbal protocols should also be developed for evacuation.	

				SUGGESTIONS
0029	Arrived at 3 cut-through. Recognised Gate End Box niche outbye of cut-through.			
0032	Arrived at 2 cut-through. Recognised cache droppers. PM (only CABA) took lead and found SCSR cache. Announced they should take SCSR's. Assessor noted and requested intention – PM said they would take as many as they could carry. Group recognised Quick-Fill Station (QFS) not far away. CABA pressure (bar) – PM 90.		Consequences of taking more than one CABA each not recognised. Group did know Deputy left in panel and no-one else. PM (CABA) complained of sore neck possibly caused by over-tightening face mask straps.	Review emergency escape protocols to ensure the issues of how many units to carry and when to change over are clearly outlined. (It is recognised that people in a stressful situation are liable to follow their instincts).
0035	Continued evacuating outbye. Group moved to outbye rib.			
0038	Arrived at 1 cut-through. Found lifeline on rib and utilised effectively. Last man (GB) separated from group – up to 50 meters separation at one stage.		No evidence that the remaining four members of group knew that he had been separated.	
0040	Arrived at A15 cut-through Main Dips. Found phone but could not read numbers to dial.		At the visibility level being experienced, the phone was not visible.	Phone number demarcation should be reviewed – suggest raised numbers and / or dedicated emergency number button with flap over it.
0043	Arrived at QFS B15 → C15. Group proceeded through pogo stick barrier and negotiated quick-fill sled to refill point. GB rejoined group at QFS. PM plugged CABA to refill and operated lever, however nothing happened. PM queried main valve with some concern. CB felt and found main valve off		Back-up facilities (spare CABA units and SCSR's) were available at the QFS. DW removed SCSR due to feeling sick – had flu. Assessors removed him from exercise after determining that he would have continued and donned and refilled /	Review entry barrier to QFS – the single pogo stick hung horizontally could be split into 3 – 4 lengths to allow easier negotiation. QFS orientation to be reviewed to enable easier and quicker access and

			SUGGESTIONS
	<p>and turned it on. CABA refilling commenced.</p> <p>DW's CABA would not refill – quick release male coupling unserviceable.</p> <p>Group identified the FRS behind the QFS and the presence of spare CABA and 60 minute duration SCSR's.</p> <p>CABA pressures (bar) after refill – 290, 285 and 280.</p>	<p>donned CABA in a real emergency.</p> <p>Requested that he complete the CABA refilling exercise.</p> <p>860 meters (8 cut-through → QFS) traveled in 51 minutes – good roadway conditions – equivalent to 1.0km/hr.</p> <p>Only one outlet used to refill – people queued rather than use the other two valves.</p> <p>Refilling of CABA carried out in poor visibility conditions.</p> <p>Refilling evident without visibility – could hear airflow into CABA suit. Fill times – approximately 1 minute to fill from 50 bar to 300 bar.</p>	<p>also facilitate the use of the multiple refill points – recommend that the station be turned 90° so that the refill points are in line with the cut-through and do not face the rib.</p> <p>Main valve operation on refill side of QFS should be reviewed – is it required? Can it be arranged to turn on when any quick-fill outlet is operated?</p> <p>Maintenance and inspection program to be reviewed to include external fittings and their operation.</p>
0055	<p>CB phoned Control – attempted to use phone in poor visibility. First call engaged and the second call no answer.</p> <p>Still no information on location of incident or conditions outbye.</p>	<p>Did CB dial the right number?</p> <p>Why not use the emergency number?</p>	<p>Training protocols should be reviewed to ensure these issues are clearly identified and outlined.</p>
0057	<p>Left QFS and continued evacuating outbye up the Main Dips 1 in 10 grade.</p> <p>Did not check belt road for conditions (this was suggested after team was travelling again).</p> <p>Used pipes (with blind man sticks) to determine route.</p> <p>Walking pace increased.</p>	<p>Walking pace was not adjusted for the slowest member.</p>	
0101	<p>Arrived at B13 cut-through.</p> <p>Group discussed drive-head outbye and possible conditions.</p>		

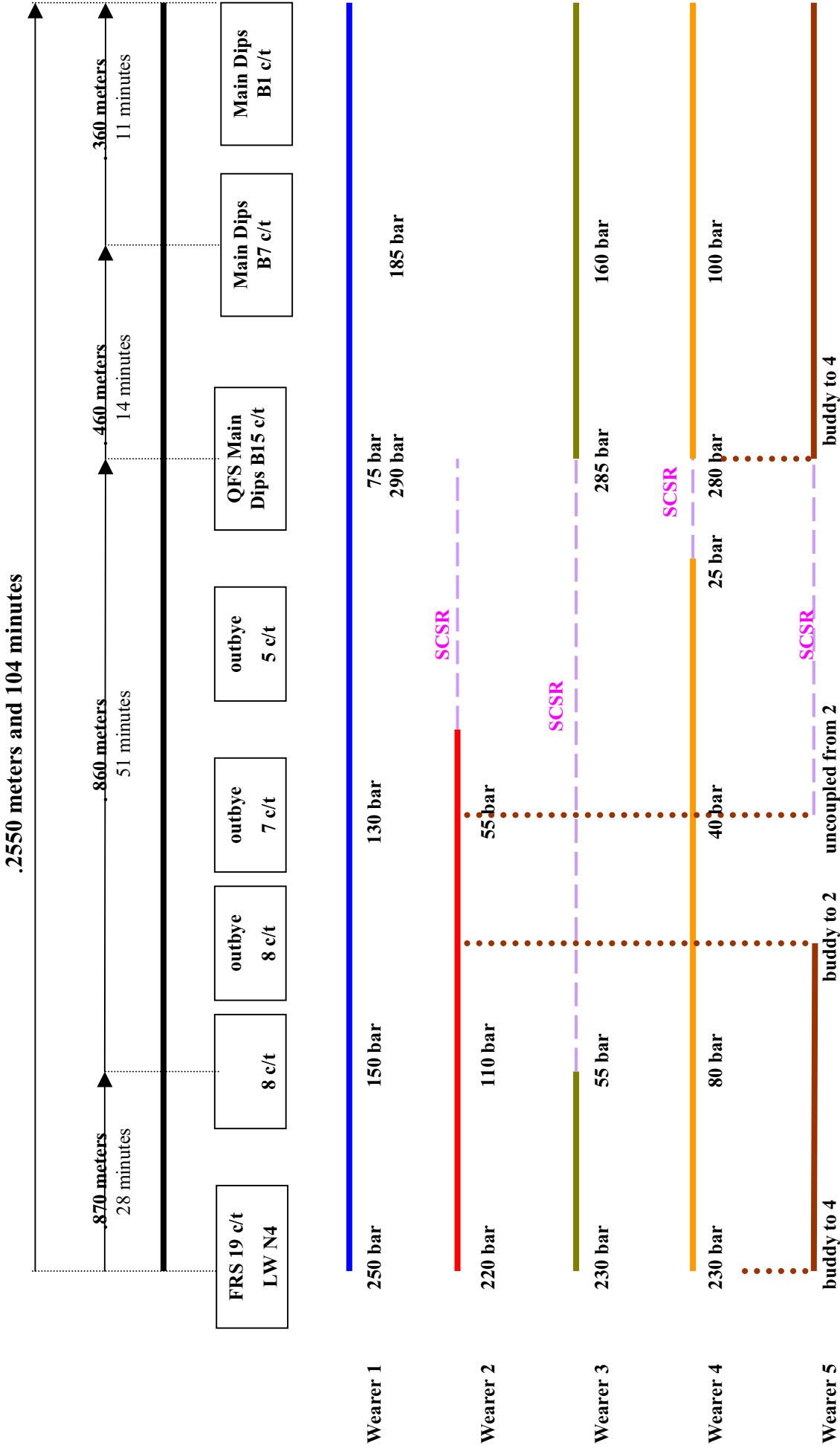
			SUGGESTIONS
0102	Arrived at B12 cut-through.		
0103	Arrived at B11 cut-through.		
0106	Arrived at 10 cut-through. Assessor informed the group that visibility had improved. Removed visibility impairment and restricted group to low beam only. Group discussed contacting Control and decided to proceed to 7 cut-through where they knew a phone was located. Checked pressure gauges.	280 meters (B15 cut-through → B10 cut-through) traveled in 9 minutes up a grade of 1 in 10 – equivalent to a rate of 1.9 kms/hr.	
0108	Continued evacuating outbye.		
0109	Arrived at B9 cut-through. SCSR cache identified. Group said they would take spare SCSR's (noted by Assessor)		
0111	Arrived at B8 cut-through.		
0112	Arrived at B7 cut-through. CB contacted Control using phone Maingate N2 entry. Informed Control of location, condition of team, environmental conditions, questioned whereabouts of Deputy, requested any more information and whether the group could do anything and then that they would head out to Portal Dips 8 cut-through QFS. Control said he would find out and ring back. CABA pressures (bar) – GB (with CB as buddy) 100, PM 185, RD 160.	Information passed by CB was well thought and complete.	
0116	After checking CABA pressures, CB buddied to PM (his CABA had the highest pressure). He then informed the group that the Deputy was still missing, two contractors were missing in the Main Dips and that there was no further information on the incident / origin of smoke.		
0118	Control phoned and requested names of personnel in the group and instructed the group to:		

			SUGGESTIONS
	<p>Proceed to 8 cut-through Portal Dips Look out for the two contractors Ring Control on arrival at 8 cut-through Control informed CB that the Mines Rescue was at 8 cut-through and had established a FAB there. CB passed this information on to the group.</p>		
0121	Continued evacuating outbye.		
0122	<p>Arrived at B5 cut-through. Comment from group member that they still did not know where the smoke was coming from.</p>	Control had still not passed any information on the location of the incident to the group.	Refer to previous recommendations on telephones.
0125	<p>Arrived at B2 cut-through. Assessor informed the group that visibility was clear (normal). <i>Group turned lights to full beam</i> GB said he would check the belt road and proceeded to do so. Opened the segregation stopping door and could see a raging fire with ribs and roof alight on the other side of the conveyor (as advised by the Assessor). Group decided they would proceed to 8 cut-through QFS and refill CABA's and contact Control.</p>		
0127	<p>Arrived at B1 cut-through. N1 Development Crew Deputy met group and advised that they were in fresh air and could remove their CABA suits. He advised that people had been fighting the fire for two hours and that transport was available to take the group to the surface.</p>		
0133	Group boarded vehicle and proceeded to surface.		

			SUGGESTIONS
0136	Arrived at bathhouse / offices – met by Mine Manager and advised to take a short break then would be required for de-briefing. Surface security duty card holder logged persons off.		
0205	Longwall crew de-briefed by Safety Superintendent and then further de-briefed by 2 nd person (at the direction of Safety Superintendent).	No structure to the de-briefing.	Review de-briefing procedures – suggest a prompt sheet be developed and / or utilised.
0302	Manager updated longwall crew on underground status. Mines Rescue on site; fire out and being monitored; Mines Rescue to search for the two missing persons. Longwall crew queried repair of broken CH ₄ drainage line. Manager replied that once ventilation returned to normal, NCA people would repair the damaged CH ₄ line.		

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CABA Timelines



Debriefing

After their part in the formal exercise had been concluded, Assessor Murray Wood debriefed the personnel who had evacuated from the longwall panel. Where applicable, recommendations and observations have been included in the above table. Some additional comments are as follows:

- Life-line at Quick Fill Station (QFS) and blind man sticks worked well.
- Oxybok SCSR's worked well.
- More practice in restricted visibility conditions is required – suggest group exercise every two months.
- CABA comfort could be improved with a review of shoulder strap arrangement.
- CABA duration was shorter than expected.
- Training SCSR's difficult to wear – tasted dusty.
- Intermediate QFS for CABA required.
- More buddy masks to enable all people in the group to have one.
- CABA packaging and layout at the First Response Stations (FRS) could be improved.
- Buddy mask should be stored separately.
- Gas detection equipment should be provided at FRS.
- CABA pressures at FRS all below 300 bar.
- Miners' belts to have a lanyard ring fitted to attach a link-line.
- If vehicle available, consider using it to escape in.

Comparative Walking Speeds

Longwall Crew

- First Response Station → 8 cut-thru Main Gate under CABA on flat grades = 1.9 kph
- 8 cut-thru → Quick Fill Station SCSR on flat grade = 1.0 kph (NB: 4 change-overs from CABA to SCSR occurred during this period slowing average travelling speed)
- QFS → 10 cut-thru B hdg Main Dips under CABA on grade of 1:10 = 1.9 kph¹

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MAIN DIPS MAINTENANCE CREW (CONTRACTORS)

MAIN DIPS MAINTENANCE CONTRACTORS

ASSESSOR : JASON THOMAS

General Comments

Excellent response by the contractors who performed well in both self-escape and survival strategies.

The “missing” contractors demonstrated excellent survival strategies. Their initiative in hand crafting a “hood” from a discarded chemical resin box and feeding it with a compressed air line was most ingenious and was the sole reason for their survival.

The evacuees were quick to respond and make the decision to don their self-rescuers and proceed outbye. They linked together and performed well as a team, evacuating outbye without vision in a slow and steady manner.

Additional SCSRs were not picked up en-route and only one of the contractors was CABA trained. Had they not reached fresh air at 10 cut-through, they may well used up the SCSR oxygen supply.

There was no attempt to phone control until vision was returned at 10 cut-through – perhaps in realisation that they could not talk with a mouth-piece and/or they were unfamiliar with the non-verbal communications protocol.

Additional Recommendations

- Control (or some other person) should regularly and frequently continue ringing the phone. This not only provides some orientation to those people lost in poor visibility, it gives a reassurance to persons who maybe able to hear it but not respond, such as the two survivalist contractors. Only one return phone call was attempted to 27 cut-through.
- Regular broadcasts down the DACs could have the same effect
- To assistance in locating phones in thick smoke, phones to give audible beep on a regular interval

- The physical shape of the hand line clearly identified the first response station. Investigate a system to physically identify phones and cache locations or audible signal
- Additional escape training under the most adverse conditions i.e. SCSR initiation and transfer in the dark. SCSR to CABA transfer and CABA initiation in the dark.
- Training in CABA for contractors.
- Training in location of SCSR caches for contractors (especially in low visibility) ¹

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MAIN DIPS MAINTENANCE CONTRACTORS – EVENT TIME-LOG

ASSESSOR : JASON THOMAS

			SUGGESTIONS
2221	<i>Rang control on 363 and read the prepared message Re: damaged methane drainage line at 27 cut-through, B to C Heading: No injuries, unsure of the full extent of the damage to the methane drainage line, still investigating.</i>	Control did not repeat the message.	
2235	Control rang back to the phone at 27 cut-through of the main dips at 22:35 to confirm / verify that the tube bundle line was damaged. Control was corrected, it was the methane drainage line that was damaged and men were still working out the extent of the problem.		Repeating the message back may have prevented this error
2245	The four (4) men were segregated (2 in each group) and a prepared message was given to two men. The two men (2) instantly, after being given the message, donned Fenzy 30 minutes units. Additional units were given to the men for the purpose of the exercise. The units were fitted within 60 seconds of being given the message. After the Fenzy units were fitted, the men were blind-folded to the extent that they could see a light shining in their face but they could not identify a hand in front of their face. Virtually 0.5 meters vision.	A minor delay was experienced by both personnel activating the canister. This may have been due to the fact that the units were not belt worn, they were picked up from the rib. A circumstance of the exercise.	
2248	<i>It was stated "it is up to you, do what ever you would do if the situation was</i>	Note: Two remaining contractors were	Linking arms to travel outbye worked

				SUGGESTIONS
	real". The two men started to proceed outbye immediately. They linked arms and slowly headed outbye.		instructed to remain behind. The two contractors heading outbye had been separated prior to smoke entering the area.	well. Control should have made further attempts to call.
2250	Phone range at 27 cut-through, B to C Heading, and the two men did not answer.			
2252	Men reached 24 cut-through over east line. At 22 cut-through, while crossing the intersection, the men deviated 90 degrees and headed straight for A Heading. When they reached the stopping they opened the man door to check the return. The man door was closed and the men made their way back to B Heading, Travel Road and continued travelling outbye. The men went to the stopping due to being disorientated while traversing 22 cut-through.		Minor difficulty was experienced negotiating 23 cut-through as this was a large intersection. While travelling 22 – 21 cut-through, they were issued with a 1 metre stick for safety reasons as the men were running their hands along the rib line and there was considerable rib spall in places with potential slip / fall.	Train contractors on a system to cross intersections when in low visibility areas.
2301	The men passed 20 cut-through without picking up additional rescue units in the cache. Men continued to travel outbye zig-zagging up the road. They did not have a standard as each intersection was negotiated they typically crossed at 45 degrees. On one occasion they used the 1 metre stick to tap the pipe for approximately 2 meters.		Caches hard to find if you are blind-folded. Men did not know that they had passed the cache location.	Install physical demarcation of essential services like cache's and phones. Train men in low visibility situations to move through the mine, especially across cut-thrus
2313	When the men arrived at 15 cut-through they recognised the hand line that indicated the FRS and a great deal of relief and confidence was evident.		Excellent recognition of location of First Response Station. First Response Station well marked.	Train contractors in use of CABA. Train contractors in SCSR to CABA change over in low visibility and

			SUGGESTIONS
	<p>The men stated that they would discard the SCSR and don the CABA unit. However, only one man was trained to use the CABA.</p> <p>To continue the exercise and maintain limited vision it was assumed that 1 man could put the CABA on while the remaining man was to continue using the SCSR to complete the simulation exercise. They continued out of the mine. (The CABA units were not actually donned and 1 man continued to use the SCSR).</p>	<p>Change over from SCSR to CABA was not tested with the contractors.</p>	<p>simulated toxic atmosphere.</p>
2319	<p>Continued to travel outbye and arrived at 10 cut-through at 23:19. Vision was returned when they reached 10 cut-through, Main Dips.</p> <p>The men checked the belt road and were told that thick black smoke was travelling inbye in the belt road.</p>	<p>The man still using the SCSR was hot, sweaty and distressed. When vision was returned he removed his SCSR.</p>	<p>Men should have left rescuers on until they reached known fresh air or instructed by an official.</p>
2326	<p>Rang control to report their position, the smoke in the travel road and that two men were still inbye and unaccounted for.</p> <p>Men continued to surface.</p>	<p>Excellent reporting by the contractors.</p>	
2348	<p>Two men arrived on surface.</p> <p>Manager de-briefed men.</p> <p>Men in the main dips had set up an air line running to empty chemical resin boxes with holes cut so you could breath from the compressed air line.</p>	<p>Very ingenious and these men would have survived as long as the compressors were operational.</p>	

Comparative Walking Speeds

Main Dip contractors, under SCSR, zero visibility, uphill grade of 1:10

- 26 – 24 cut-through – 140 meters (4 minutes: 2.1 km/hr)
- 24 – 20 cut-through – 208 meters (9 minutes: 0.5 km/hr)
- 20 – 15 cut-through – 284 meters (12 minutes: 1.42 km/hr)
- 15 – 10 cut-through – 280 meters (6 minutes: 2.8 km/hr)

Average

- 26 cut-thru → 10 cut-thru = 1.4kph ¹

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SURFACE BASED AND IN-SEAM INTERVENTION

SURFACE BASED INTERVENTION

ASSESSOR: MURRAY BIRD

The positive attitude of the Newlands employees and contractors to the exercise was excellent. The knowledge and understanding of the mines emergency systems was impressive.

The comments and recommendations listed in the following assessment tools are not meant to be a criticism of Newlands mine, or their emergency plans and systems. In fact, Newlands are to be congratulated on having one of the best pre-planned and organised emergency systems in the coal mining industry in Australia. The recommendations listed are in the finer details area because the mine has covered all the main issues normally discussed in an audit report.

Some of the ‘best practice’ observed during the exercise were:

- Level of knowledge of all employees of the emergency systems
- Mine security system and protocols at portals and gates
- Mines rescue plans for IMT and the mines rescue briefing room
- Allocation of areas for specific functions during an emergency (IMT, mines rescue, briefing rooms, etc) and the communications between each area (DAC, phone, computers, etc)
- Use of electronic white boards for mines rescue team briefing and for recording instructions
- The mine’s Personnel Location Board which not only gives each person’s location underground, but is also a check that there are not too many people in an area in relation to the self escape system

A summary of recommendations includes:

Communications

A detailed schematic of the information channels and flows is provided as Appendix I. As can be seen, some of the essential communication links were missing viz. IMT → Fire-Site, whilst some others were too long in being established viz. IMT → Debriefing information from both survivors and QMRS Teams.

To assist in alleviating these issues, it is recommended that

- IMT to directly brief anybody being dispatched from the surface (FAB personnel, transport drivers, mines rescue teams etc) or at least be present during the briefing.
- Allocate a person as Surface Coordinator to oversee all of the surface tasks, movement of personnel in and out of the mine and liaison with IMT. The control, allocation and updating of the deployment and availability of resources is a vital function of a coordinated emergency response and cannot be overlooked
- Allocate a designed Coordinator to the critical area underground to oversee operations and to communicate directly to IMT – this is especially critical when there are multiple groups operating in one area.
- A clear decision and instruction on what BA is to be used by persons, that is, BG-174 or CABA, when both are available.

Use of Pro-formers and Prompt Boards

The white boards for IMT can be pre-formed and ready to be filled in with information like: goals, priorities, location of men underground, known facts, assumptions or data to be confirmed (and how to confirm), gas trending, intervention activities, contingency plans (who and what) etc.

The mines rescue briefing room can have schematics indicating location (surface and underground), type, quantity, pressures of all breathing apparatus equipment that can be used. This schematic could include poor visibility walking times between cache and CABA locations.

The mines rescue room can have a wall prompt indicating priority actions for QMRS personnel as they arrive and when allocated to rescue room duties.

The mine's rescue briefing room can have a white board pre-formed and ready to be filled in with information like: priorities, facts, gas readings, team information (captain, names, tasks, ETA's etc)

There could be a pro-forma for debriefing of persons coming out of the mine. ¹

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IN-SEAM INTERVENTION - QUEENSLAND MINES RESCUE

ASSESSOR : PETER BAKER

The effort and commitment of the members of the QMRS (staff and volunteers) to respond to a simulated emergency at this time of night needs to be congratulated. Most had worked long shifts on the Saturday and were called out after very little, if any, sleep and many traveled long distances to participate.

The problem with conducting simulated U/G Mines Rescue events is, and always has been, creating the realism necessary to keep adrenaline high for all participants. Addressing these realities requires a balance in the practicalities of simulating an underground emergency environment, with the need to ensure realistic time-frames are incorporated into the simulation. The challenge of how to maintain the intensity of fire-fighting teams over an extended time period (3 hours in this case) is a significant issue. Conversely, there is little benefit in having teams instructed that the fire is under control only minutes after fire-fighting has commenced. This exercise provided no easy solution to these issues and it has been recognised by the assessment team that greater resources are needed for this in the future.

The purpose of this section of the Level 1 Emergency is to assess the practices and procedures adopted by the Mines Rescue teams in comparison to the mines rescue training provided - in order to assess the adequacy of the procedures themselves and the understanding of those procedures by the teams. The actions of each of the Mines Rescue teams is detailed in the time-line logs at the end of this section and the section on the “N1 Development Panel”.

Recommendations

As an outcome of these assessments, it is recommended that

- there be a review the Mines Rescue Guidelines in early part of surface intervention (i.e. when minimum persons are available)
- further efforts are implemented to ensure that all team members are aware of the task they have been asked to perform and each person’s role in the team (there appeared to be confusion on team roles when the original team captain was reassigned to FAB control)

- consideration be given to the use of ‘ex-brigadesmen’ in roles such as FAB officials to allow full use of ‘BA current’ men (this is particularly relevant when rescue volunteers are few)
- MRS teams are to ensure ALL team protocols are adhered to - even in the absence of reality, it is good practice (e.g. communications and information left with FAB official, captain/team checks on equipment etc.)
- a formal log be kept of the location and status of all rescue equipment (this task is probably best done by surface control, although it requires input from FAB officials). This becomes particularly important when two types of BA were available for use.
- Guidelines be developed and implemented for the use of vehicles in potentially poor visibility.
- emergency communication protocols be reviewed. The rescue efforts were hampered by a lack of effective communications between the FAB and the surface. The solution presented by the Rescue Controller to cut the telephone lines at 2cut-thru and install a phone was prevented by the assessment team. In the scenario, this would have cut communications to the remaining survivors underground - and in the reality, it would have severed communication to the rest of the mine (some sections of which were still operating). There should have been better options.

and perhaps most importantly, it is recommended that

- *an expert working party be established to develop and implement a set of Guidelines on the protocols for a combined mine-site and QMRS intervention effort (i.e. when is it O.K. to keep panel crew on BA? When should Mines Rescue teams take over? How should these two groups interact with each other? What are the potential risks?).*

The exercise clearly showed that the better the escape systems (and therefore survival systems) in place at a mine, the more likely it is that Mines Rescue teams will be required to enter and search for survivors – the industry as a whole needs to ensure we are ready for this.

IN-SEAM AND SURFACE BASED INTERVENTION – EVENT TIME-LOG

ASSESSOR : MURRAY BIRD

			SUGGESTIONS
2325	Control Room Operator (CRO) instructed by Mine Manager to contact mine site Mines Rescue Coordinator who was to put QMRS on standby.	The phone numbers to contact the Mines Rescue Coordinator were correct.	Nil
2353	Mine Site Mines Rescue Coordinator (MRC) arrived on site.	Was given a quick overview and updated from CRO.	Nil
0005	Mine Manager briefs the Mine MRC.	A full briefing from Mine Manager. Requested by Mine Manager to determine who is underground and not yet accounted for.	Good briefing with excellent detail obtained in the mine rescue emergency plans. At this stage it would have been preferable that the basic data was being written up on the white board in IMT. It would have made this and subsequent briefings easier. The mine manager had started to do this earlier but was too busy to continue doing so. An IMT scribe would have been handy. The mines rescue plans maintained at the mine are the most detailed and useful documents I have encountered. As they are plasticised you can record updated information on them.
0007	MRC contacts North Goonyella.	Confirmed that there were 5 rescue trained employees on shift and 3 in town. An estimated ETA of 1 hour for these personnel.	Information recording by the MRC was good. A carbon copy note book was used so that all information was in duplicate. An update of information could be handed to IMT or the CRO at

		SUGGESTIONS	
			anytime. This worked well especially as there was so much activity occurring.
	MRC establishing who was underground.	Reviewed the man allocation board to establish who is where and who is unaccounted for.	This manning board, which has photo ID for all employees and regular contractors clearly indicates who is where on shift and that there are not too many employees in any self escape zone. This was an excellent checking system.
0011	MRC briefed by Mine Manager.	Managers priorities were to find out what was happening with the fire at 2 cut-through and to find out how big the fire was. Instructed MRC to contact 2 cut-through, scope the fire dimensions, develop a fire-fighting plan which included attacking it from both sides and to consider how the smoke could be removed or reduced. Mine managers' priorities were clearly the fire at this time. Obtaining information from 2 cut-through fire zone was difficult and spasmodic.	The emergency white board on IMT could be pre-laid out with main headings that can be used as prompts, e.g.. Priorities, factual data, assumed data (to be confirmed and how), gas readings (trends), last known location of underground personnel, actions taken and contingency planning (who and what). This was clear to the MRC but not sure that this priority was clear to all other persons involved.
0015	First of the local Mine Rescue Brigades to arrive.	Two of the local brigades continued with the development of the fire fighting plan. Once the third member arrived he commenced briefing and allocating duties to other team members as they arrived. Suits were tested and the captain of the first team established.	Well controlled and coordinated group. There was urgency but not panic or any time wasting observed. What is the reporting/control protocol for team members as they arrive – is it documented. The MRC allocated all of the tasks and did it well, but if he was absent would it have operated the same way? The mines rescue team room could have

		SUGGESTIONS	
			a prompt board in it to clearly indicate the main functions of the first three persons arriving, including equipment tests, basic data onto white board, transport serviced and ready, etc.
0017	MRC calls out the GAG unit (<i>NOTE: Instructed to do so by audit team as part of the exercise</i>).	All phone numbers were correct and the unit was activated. No ETA was established at this stage as the appropriate GAG personnel had to be contacted first.	Manager was not sure that others involved in IMT were aware of this information. If the IMT white boards had been established this information can be recorded on them by the MRC after the phone call. IMT must be the center of all critical information. This is one of the most difficult things to achieve when there are a number of separate people or groups involved.
0023	MRC gives an updated briefing from discussions with 2 cut-through personnel.	All of the local mines rescue team members who were in and around the mines rescue room were given a detailed briefing of what had and was happening by the MRC. Information not captured from discussions with 2 cut-through was that they were using foam on the fire and were wearing CABA units. The two brigadesmen (one who was the designated captain of the first team) were working on the fire-fighting plan had finished it. They discussed it with the MRC before handing him the paperwork to take to IMT.	Information from 2 cut-through was recorded in the MRC carbon book but was not put up on the whiteboards in the rescue briefing room nor IMT. This meant that it had to be repeated at different times and some information was lost in the transfer. The plan was detailed and clear with a good diagram of the fire zone at 2 cut-through.

		SUGGESTIONS
0027	MRC update 2 cut-through.	<p>Deputy from N1 panel contacted CRO and MRC giving an update. It was clearly explained that the fire was between C and D heading and was large, mine employees were fighting it with foam, under CABA from both C and D Heading. Also that B Heading was clear of smoke down to 10 cut-through. Briefing from N1 Deputy was good and captured all of the main facts. N1 Deputy requested a runner as it was difficult to fight the fire and continually go to the phone (distance). MRC briefed team that they would not be dispatched underground until a standby team had arrived. MRC went to discuss the fire plan with the mine manager.</p> <p>Not all of the information from the N1 Deputy was transferred to IMT. IMT was having a problem communicating with 2 cut-through as was the N1 Deputy. The problem was clear but the solution was not. It appeared that persons were not clear as to where the phone / DAC system was in relation to the fire-fighting activities. As 2 cut-through was the critical zone and the main priority at this stage it would have been preferable to have IMT briefed directly by the Deputy than to double handle the information.</p> <p>Not all of the information from the N1 panel Deputy at 2 cut-through was passed on to the mine manager by the CRO or MRC. Missed was roadway clear to 10 cut-through, mine workers currently fighting fire with foam from C and D roadways and N1 Deputy requested more men including a runner for phone calls.</p>
0028	MRC updated information.	<p>MRC confirmed that a total of seven QMRS trainees were coming from the North Goonyella mine with an ETA of 40 min. MRC confirmed that at this stage he required men more than equipment so don't waste time getting their mines rescue gear. MRC sent one mines rescue team member to service</p> <p>The decision not to have any equipment dispatched could lead to problems later. It would be better if an employee of the sister mine or one of the mines rescue trained persons from that mine loaded and dispatched at least equipment for one team while the other persons went directly to the effected mine. This was very well done on the day and saved time.</p>

		SUGGESTIONS
		<p>vehicles in preparation for dispatch.</p> <p>Mine manager was having difficulty in getting good regular information from 2 cut-through.</p> <p>As a priority he required that mines rescue teams establish FAB, communications and assist in fire-fighting operations.</p>
0040	<p>IMT gives the MRC a briefing on what the first team is to do.</p>	<p>Priority is to have the team establish a FAC at the Quick Fill Station (QFS) at 8 cut-through in the Portal entries. They are to establish communications and maintain them with the surface. All additional personnel are to assist on fire-fighting activities.</p> <p>The manager (IMT) requested that the MRC also find out what the gas levels were throughout the mine, what the normal walking time would be from Longwall 4 in poor visibility, how the ventilation could be improved at 2 cut-through and down B Heading in the Mains.</p> <p>The managers (IMT) final instruction was that nobody is to go underground until he (IMT) had been fully briefed from 2 cut-through and had cleared them to go.</p> <p>At this stage the vehicles were ready and the team were still testing suits and minimum equipment. As the team had not been briefed on their tasks at this</p>
		<p>It should be a standard documented procedure as it is so easily forgotten and has led to transport failures later in an exercise, that is, lack of vehicle servicing.</p> <p>IMT should have established direct communications to the Deputy at 2 cut-through for regular updating.</p> <p>None of these instructions were recorded on the white boards in IMT so that all knew what was happening.</p> <p>IMT should have established direct communications to the Deputy at 2 cut-through for regular updating.</p>

		SUGGESTIONS	
		stage they did not know if any additional equipment was required.	
0053	MRC briefs Mines Rescue Team Captain.	<p>After discussions with the mine manager, MRC re-allocated the Mines Rescue Team 1 Captain to be the FAB controller. FAB was to be established at the refill station at 8 cut-through in the Portal Mains. His main task was to establish and maintain communications. The remainder of the team (4 men) were to assist mine personnel with fire-fighting.</p> <p>The other team members were not present during this briefing and did not know that their captain had been issued a different task. As such nobody else was made team captain and nobody automatically stepped up.</p>	<p>The pre-developed plans (12 copies) of all part of the mine that are maintained in the mines rescue emergency mine plans are an excellent idea. This is especially important at any location that can not guarantee that a surveyor can be obtained early.</p> <p>The only comment is only hand out required number of copies and not all at once.</p> <p>At this stage all of the information had been recorded on different pieces of paper which makes it difficult to bring it all together. Pre-established white boards in the mines rescue briefing room could be used. These could contain information like: basic data, names of teams, captains and FAB officials, tasks to be carried out by team, etc.</p> <p>Had something like this been in place then this later change in the team captains' role would have been picked up.</p>
0057	CRO was advised by N1 panel deputy.	Deputy reported that they were out of low expansion foam, cannot get within 20 meters of the fire and require backup personnel for hose work.	
0103	Mines Rescue Team 1 has all equipment ready and loaded into transporter.	The team had five BG-174 and minimum equipment tested and loaded ready to go underground.	

		SUGGESTIONS
0105	Mines Rescue Team 1 being briefed by the MRC.	<p>All mines rescue men at the mine were included in the briefing. Instructions were written on an electrical white board in the mines rescue briefing room. Instruction included:</p> <p>The establishment of FAB at 8 cut-through in the Portal Mains.</p> <p>Assisting N1 panel men in fire-fighting.</p> <p>The taking of additional low expansion foam.</p> <p>The taking of three spare CABA units.</p> <p>The use of the electronic white board was excellent. Directions were written and corrected quickly with a copy printed off for the team and for surface records. This is always a difficult part of any emergency where time is of the essence and this is an excellent solution.</p> <p>IMT should be present for this briefing especially as it was for the first team entering the mine. There should be limits established – visibility, temperature, time etc. These instructions should also be signed off by the manager.</p> <p>Some additional equipment that might have been considered was first aid gear for burn injuries, pure oxygen for anyone overcome by smoke, CO etc.</p>

		SUGGESTIONS	
0112	Mines Rescue Team 1 leaves the surface.	The five men traveled to 8 cut-through in the Portal Mains in two transports with all equipment they were requested to take.	As 2 cut-through was the priority area and there were now going to be N1 panel personnel and rescue teams operating in the area, and Area Coordinator should have been allocated. This role would be to coordinate activities in this area and to communicate with IMT on a pre-arranged time schedule. This can be the role of the FAB official but in this case FAB was some 160 meters outbye of the fire zone. The mines rescue team did not use the manning board. Had a Surface Coordinator position been allocated then this would have been part of his responsibilities.
0114	MRC continues rescue team plans.	MRC continues developing plans for fire-fighting, clearing smoke from the 2 cut-through area and sending a team to investigate the Main Dips where there are two men still missing.	

		SUGGESTIONS	
0117	Mines Rescue Team 1 arrives at 8 cut-through in the Portal Entries.	8 cut-through in the Portal Entries is the location of an outbye CABA refill station. Unfortunately, there is no phone located at this site, it was some 160 meters outbye of the fire at 2 cut-through and no runner had been allocated. The phone issue was picked up by the MRC after the teams formal briefing and he verbally instructed the team to take the emergency phone with them – this was forgotten in the teams haste.	These simple mistakes are likely to occur when IMT is one person. There is so much information and data and everybody is hyped up. Some, if not all of these small errors should have been picked up if the IMT, in conjunction with the MRC, had conducted the teams final briefing before they were dispatched.
0117	Mines Rescue Team 1 assist with fire-fighting.	Mines Rescue Team 1 left their BG-174 units in the rib at 8 cut-thru and used CABA units to assist with fire-fighting.	<p>Nobody on the surface knew that this equipment was being used although it is the more suitable type of equipment for fire-fighting.</p> <p>When you have two different type of BA available then IMT must be detailed in its instruction on which one is to be used.</p> <p>A board in the mines rescue room would be an advantage in these situations. A simple schematic of the mine (both underground and surface) which shows what equipment is where would make resource control easier especially in a protracted fire-fighting emergency. This schematic could include details of unit type, quantity, cylinder pressures (as last tested) and refill bank pressures. During an emergency or exercise the board can be updated so that critical resource data is maintained.</p>

				SUGGESTIONS
0123	MRC updated resources.		MRC called sister mines and QMRS to obtain an updated on ETA of teams, extra equipment and GAG. MRC allocated a different person to the mines rescue room. This person did not test suits in preparation for the next team and spent very little time in the room.	A job card maybe needed to detail what should be done in preparation for the next team or just general functions required in the rescue room.
0136	Longwall 4 crew arrive at surface.		A room was allocated for the Longwall 4 crews debriefing. An informal debrief was conducted to get the main points for IMT. The crew were given time to refresh themselves (water and food) before the formal debriefing was to occur.	Good allocation of rooms and areas. There was plenty of room for all to be seated and to participate in the process.
0147	Second Mines Rescue team arrives.		The North Goonyella team arrived and commenced to get changed and test equipment.	
0148	FAB Official contacts surface.		A detailed briefing on the status of the fire was given.	There was no comment on the problems with the location of FAB and DAC phones.
0206	MRC commences Longwall 4 crew formal debriefing.		The MRC and an assistant were present. The critical information was obtained by the MRC for transfer to IMT. Following this the assistant commenced the detailed debriefing and formal written report for the crew.	A report template would have assisted in the formal written report.
0225	Mines Rescue Team 2 North Goonyella ready.		Team has all suits and minimum equipment tested and ready.	This could have been much earlier had the mines rescue room assistant tested equipment while waiting for the team to arrive.

		SUGGESTIONS	
0229	Mines Rescue Team 1 reports that fire is out.	Both the FAB Official and N1 Deputy told to come out for briefing with IMT and to assist with next planned actions.	
0230	MRC and Mines Rescue Team 2 planning.	Rescue plans were commenced and discussed in relation to search and recovering the two missing men in the Main Dips.	The atmosphere on the surface changed from stressful and structured to informal and unstructured. The decision processes broke down or disappeared and the urgency had stopped. There was an air of “this is all over” yet there were still two persons missing.
0253	Mines Rescue Team 2 North Goonyella formal briefing commenced.	The team were to travel down B Heading to the Main Dips in a transport and to search for the missing contractors.	No limits were established in the briefing, that is, methane levels, temperature, visibility etc. It was assumed that the atmosphere would be clear by the time they drove into the area.
0300	Mines Rescue Team 3 Moranbah North arrived.	Nine employees from Moranbah North arrived and commenced getting changed.	

			SUGGESTIONS
0315	Mines Rescue Team 2 North Goonyella leaves the surface.	The team is to drive down B Heading to the Main Dips and to search for the two missing contractors. The team instructions were not detailed, that is, they were to go to the cache at 20 cut-through and if the two men were not there then search for them. The team did not take any additional equipment for the two missing persons but there were plenty of SCSR's at 20 cut-through cache and CABA units at 15 cut-through in the Mains.	This was out of character with the rest of the exercise. The pre and background briefings were detailed and thorough but the final task briefing was not. This was probably due to the belief that there would only be clear and fresh air conditions encountered and that the teams task was only a formality for the exercise. The mines rescue team did not use the manning board. Had a Surface Coordinator position been allocated, then this would have been part of his responsibilities.
0316	Mines Rescue Team 3 Moranbah North briefing.	Team members are changed and given a detailed background briefing by the MRC. During this briefing nobody is testing the suits so the team does not have its equipment ready.	There appeared to be a general feeling that this team was not going to be used.
0321	QMRS Manager arrives.	Vehicle with mines rescue underground communications and in-seam gas monitoring equipment. Spoke with MRC to get an update of what was going on. Had to wait for a briefing to occur.	QMRS Manager could have gone into IMT for a full briefing.
0337	Fire flares up again – Mines Rescue Team 2 encounters smoke.	Mines Rescue Team 2 North Goonyella encounters thick black smoke at 10 cut-through in B Heading, Mains. Instructed to return to 2 cut-through.	

				SUGGESTIONS
0338	Mines Rescue Team 3 Moranbah North – commence testing their equipment.	The team commenced and testing equipment. There were only five BG-174 units left and one had been tagged out by an early team. This suit tested OK and was used by this team.		Equipment levels had not been monitored. There are only 18 BG-174 units maintained at the mine. Five were in the rib at 8 cut-through (unknown to the surface personnel) and eight with Team 2. <i>See information on recommended resource board in 0120 comments.</i>
	High expansion foam generator to be deployed.	The mines high expansion foam generator was to be used to fight the fire at 2 cut-through. Some foam was available but it was found that the generator was in Longwall 4 following a fire training during the week.		
0350	Mines Rescue Team 3 Moranbah North is ready.	Team had completed its equipment checks and was awaiting additional equipment and instructions.		This could have been completed much earlier had the mines rescue room assistant tested equipment while waiting for the team to arrive.
0400	Three men sent to FAB.	Three mines rescue men were sent to FAB with the QMRS underground communications equipment. They were to establish communications and maintain FAB.		The persons going underground did not use the manning board. Had a Surface Coordinator position been allocated then this would have been part of his responsibilities.
0403	IMT decided to source another foam generator from North Goonyella.	Due to the mine's unit not being available and the need for high expansion foam.		
0405	IMT plans next move.	IMT was fully manned and functioning very well. All the plans and alternatives were discussed and considered.		IMT personnel were obviously tired but they functioned well and were well structured. IMT did take full control of the situation. Although it was discussed there still wasn't any contingency plans being developed.

		SUGGESTIONS	
	Second QMRS vehicle arrives.	A vehicle with BG-174's and minimum equipment for two teams arrives.	
0430	IMT gives Mines Rescue Team 3 Moranbah North a briefing.	The IMT gave the team a full briefing of its requirements. They were to practice their way into 2 cut-through in preparation for high expansion to be applied. During their task communications were a must if they were lost then team was to be withdrawn.	Good briefing with limits established for team. Again, excellent use of the electronic white board in the briefing room with a print out being given to the team. A copy for IMT should also be kept.
0435	Mines Rescue Team 3 Moranbah North leaves the surface.	Team is driven to FAB before commencing preparation for high expansion foam deployment.	The mines rescue team did not use the manning board. Had a Surface Coordinator position been allocated then this would have been part of his responsibilities.
0450	Fire is reported as out.		
0503	Underground Exercise is terminated.		
0512	Desktop exercise continued to develop search and recovery contingency plans for the missing contractors in the Main Dips.		
0600	Desktop exercise terminated.		
0658	Second vehicle from QMRS arrived.	Vehicle arrived with BA and minimum equipment for two teams. GAG manager also arrived.	
0700	GAG arrived on site		
1125	GAG engines started.		
1138	GAG engine shut down.	Test successful.	

SITE SECURITY

ASSESSOR : JAN OBERHOLZER

Protecting and preventing people on the surface from becoming casualties of an underground incident and accounting for and looking after people exiting the mine is the core function of the Surface Security Coordinator.

The role's priorities are to:

Visually inspect the pit top area gathering up all persons and directing them to the muster area for further instructions.

No prior inspection as there was no persons available to do this. The mustering area was not used.

Post sentries to the emergency stations.

Sentries posted and conducted duties according to card issued to them.

Lock the access gates on pit top at the southern and northern ends of the surface lay down areas and ensure the boom gates are down.

Was done according to instructions given and cards in posts.

If you have no other help, man Emergency Station No. 1.

Practically impossible to do when there is a shortage of staff. However, first available worker from plant was allocated to this duty.

Depending on level of emergency, man Emergency Stations 2, 3, 4, 5 and 6 by appointing others to those posts to follow the instructions posted at the station.

Was done as staff became available.

Contact the Surface OCE and second him to inspect and secure the following sites looking for damage or any change or indications of smoke, gas and ventilation flow direction;

Main fan switch yard area; Surface to seam boreholes used for gas drainage; Surface to seam boreholes used for gas inertisation; Tomlinson boiler site; and Surface subsidence area.

Prevailing situation did not lend itself to these actions as there were no staff to do this.

Ensure you and any person you may direct to man emergency stations have a radio, helmet, belt and SCSR. At night, a cap lamp will be required.

Person manning point one did not have a SCSR nor did he obtain one.

Maintain a log of all actions taken, appointments made, instructions given and communications made, and provide the original copy to the Site Emergency Controller when required.

Action checked periodically and it was found that all staff manning these points were keeping a log and at the time checking these logs were accurate.

Follow any written instruction from Site Emergency Controller.

No comment as no evidence of written instruction was seen or found.¹

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SITE SECURITY

ASSESSOR: JAN OBERHOLZER

			OBSERVATION
Pre-planning What did the mine have?	Suitable emergency plans setting out the process that has to be followed to maintain site security during a mine emergency.	Document showing the actual plan.	Yes
How did they prepare for the emergency?	Suitable plan and methods whereby staff are made familiar with the process of maintaining site security during a mine emergency.	Document showing when and who have been allocated responsibilities for organising and conducting the maintaining of site security during a mine emergency and who have gone through the content of the plans.	Yes
Does the process identify the responsible persons?	Suitable written allocation of the responsibility of maintaining site security during a mine emergency.	Document showing allocation and acceptance of responsibility for site security and setting up of the process in the event of an emergency.	Yes
Planning and Procedures Do the plans say what they are for?	Applicable section of the plan setting out the objectives that the implementation of the plan strives for.	Do the plans give a stated objective against which performance can be measured.	No
Did they have the necessary plans in place?	Availability of the plans as well as ensuring that involved staff are fully aware of their duties to maintaining site security during a mine emergency. Allocation of responsibilities of whom will conduct maintaining site security.	Documents, showing the actual plans available for perusal by involved and other staff. Proving that relevant staff members have made themselves familiar with the plan. Has it been noted? Has allocation of responsibilities been done?	Yes

			OBSERVATION
Do the plans say how this is to be achieved?	Applicable section of the plans should set out how the site security during a mine emergency should be achieved.		Yes
Do the plans identify who are responsible for their execution?	Applicable section of the plan stating who will be responsible for ensuring that actions are taken in accordance with the objectives.	Identification of responsible person and person acting to implement the maintenance of site security. Goes according to stated objectives.	Yes
Do the plans say how those involved can ensure that what is to be achieved, is?	Applicable section of the plan stating how control over the site security is to be installed and maintained throughout the emergency period.	Document stating control procedures. Person conducting control.	No
Do the plans identify who will control the success of execution?	Applicable section stating who controls the site security to ensure that the objectives are met.	Document detailing allocation of responsibilities for ensuring control.	No
Communications Inwards Do the plans state how those whom are involved are to be informed and that they have to execute what is in the plan?	Applicable section in the plans detailing how those involved with the debriefing are to be informed about when, how and what they have to do.	Document detailing how the responsible person are informed about how and what they have to do.	Yes
Execution Were the plans used?	The debriefing action were conducted in accordance with the plans.	The actions of the involved staff were according to the stated plans.	Yes

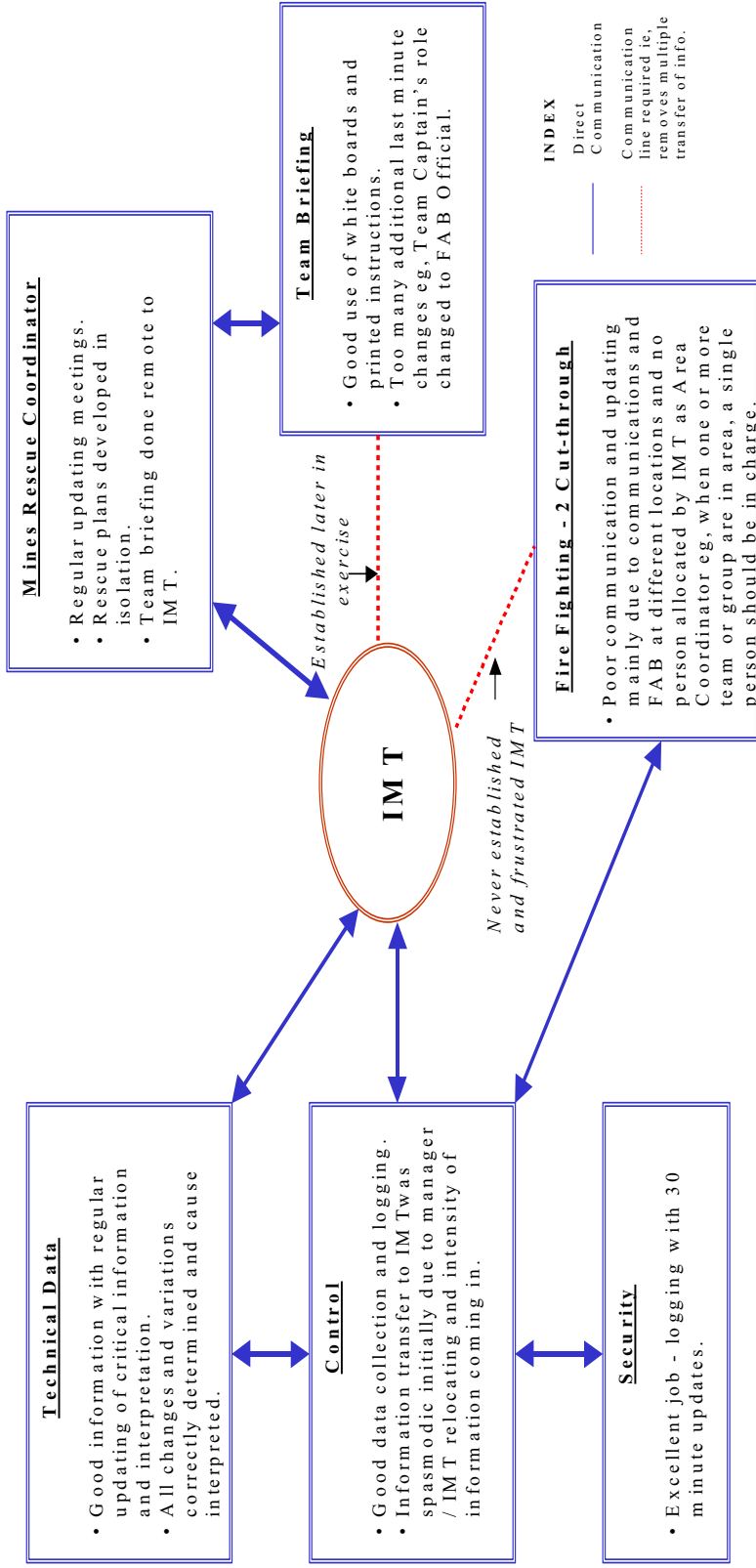
			OBSERVATION
Did the people know what were in the plans or did they have to find out when it happened?	The involved staff was fully conversant with the contents of the plan and the duties they have to execute.		Actions were taken according to the plan without referring back to the plan in detail to ensure that the actions were right. Evidence of familiarity with the process.
Did they use what was in the plans?	The involved staff conducted the debriefing according to the plan.		Yes
If they did, how did they use them?	The staff to conduct the site security were informed in a suitable fashion. A suitable points was allocated and established.	Was the following done? Responsible persons informed. A suitable points and facilities provided and set up. Necessary following of process according to plan.	Yes Yes Yes
Flexibility Where there circumstances that required a change of the plans?	The plans should cater for changed circumstances.	Does the plan cater for changing circumstances.	No – the circumstances were such that no change of plans were required.
How were the people involved informed of a change in circumstances?	The plans should state under which circumstances changes should be needed and how this is to be communicated.	Communication from responsible staff that circumstances not foreseen in the plans have occurred and that additional or other processes or methods have to be used.	N/A
Was the necessary flexibility used?	There should be adequate flexibility to cater for unforeseen circumstances.	Was this exhibited in the event of changed circumstances. (This could be very important in the event of the safety plan on the mine not coping with all possible circumstances).	N/A

			OBSERVATION
Control			
Did they use the processes as set out in the plans right?	The plans should identify control processes to be used to ensure that the debriefing is done in the right way.	Is there documented proof that control of the process is catered for.	Yes
How did they ensure that under changed circumstances they did the right things?	Control of the process has to be done by management of the mine to ensure that the objectives of security is achieved.	Evidence of a responsible person controlling the security process. Evidence of a responsible person controlling the information flow process.	Yes
Did they control their own work?		Evidence of a responsible person controlling the security and integrity of the information is maintained.	

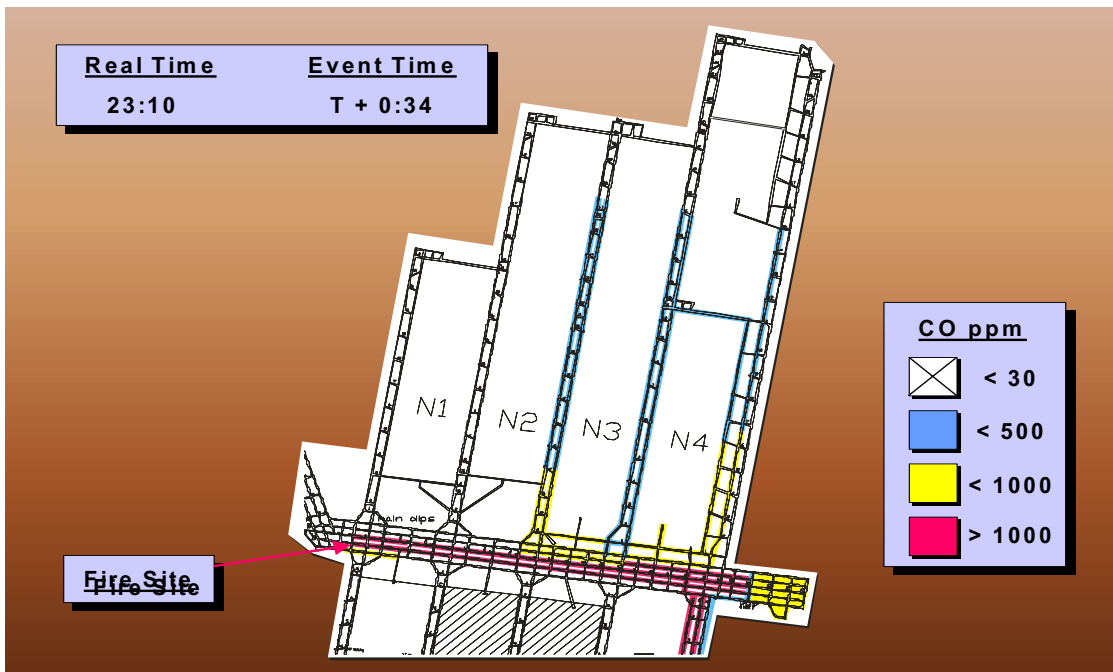
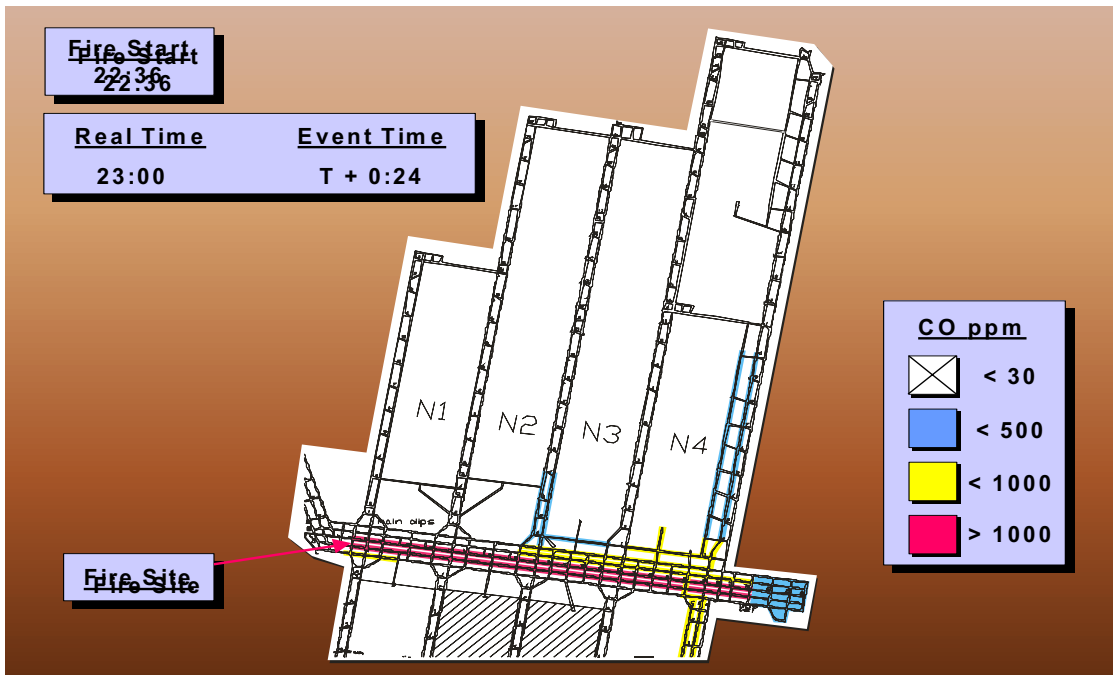
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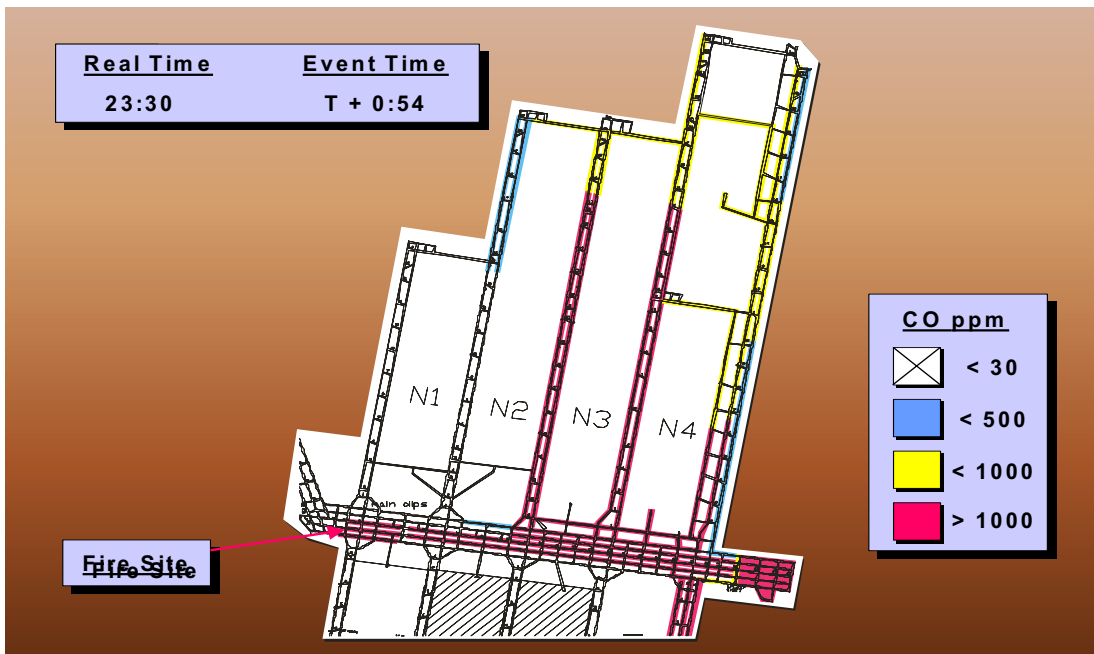
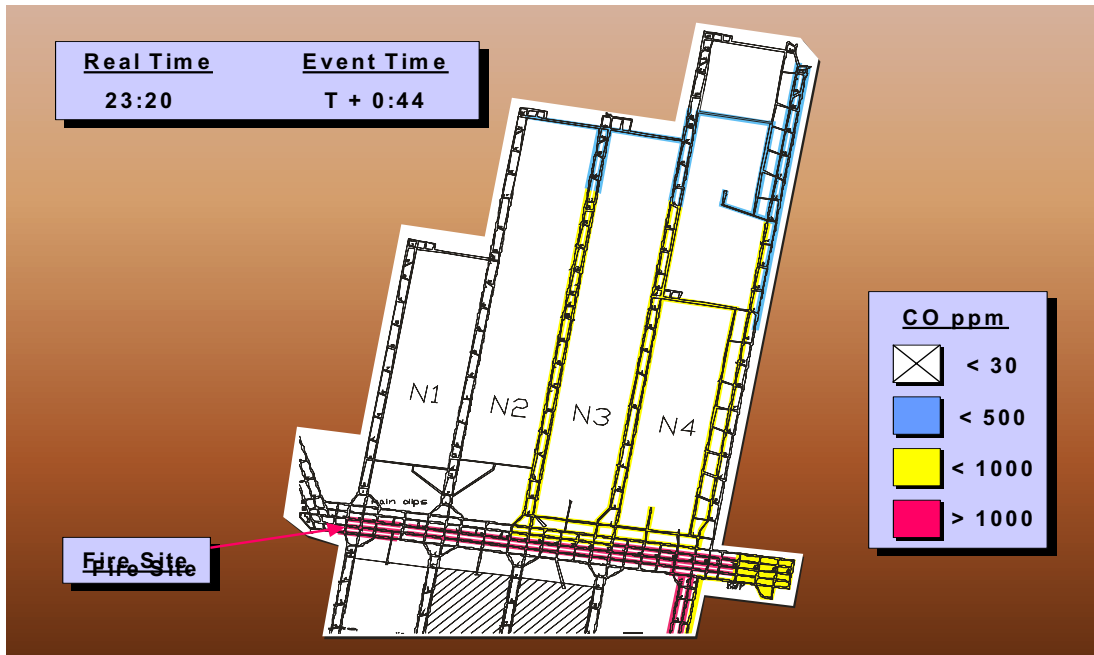
PART C : APPENDIX

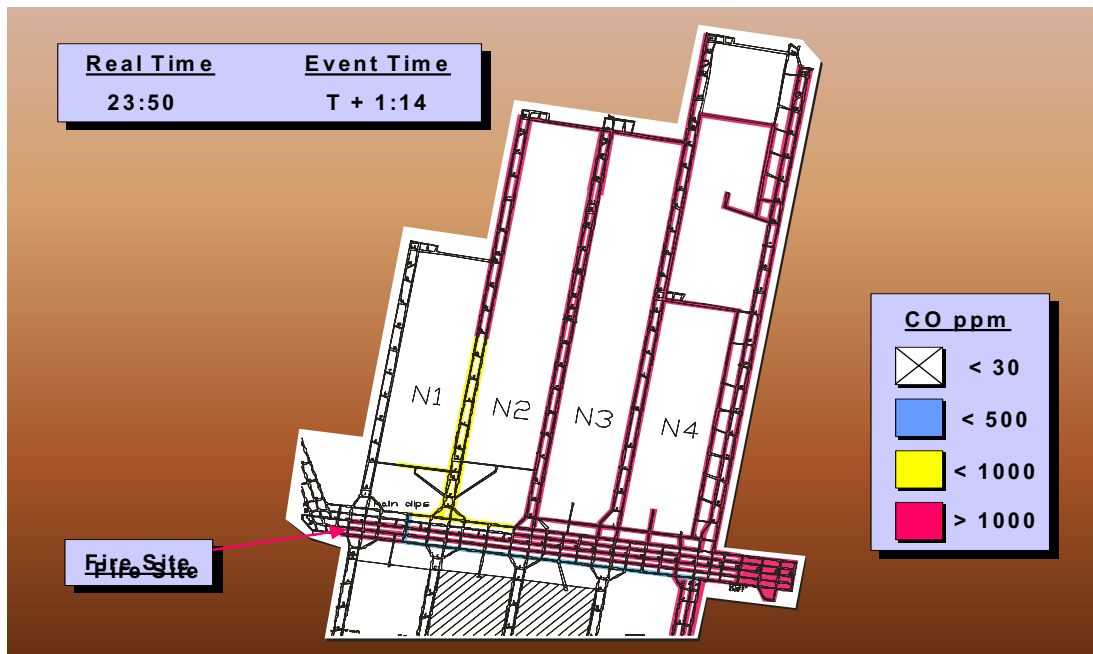
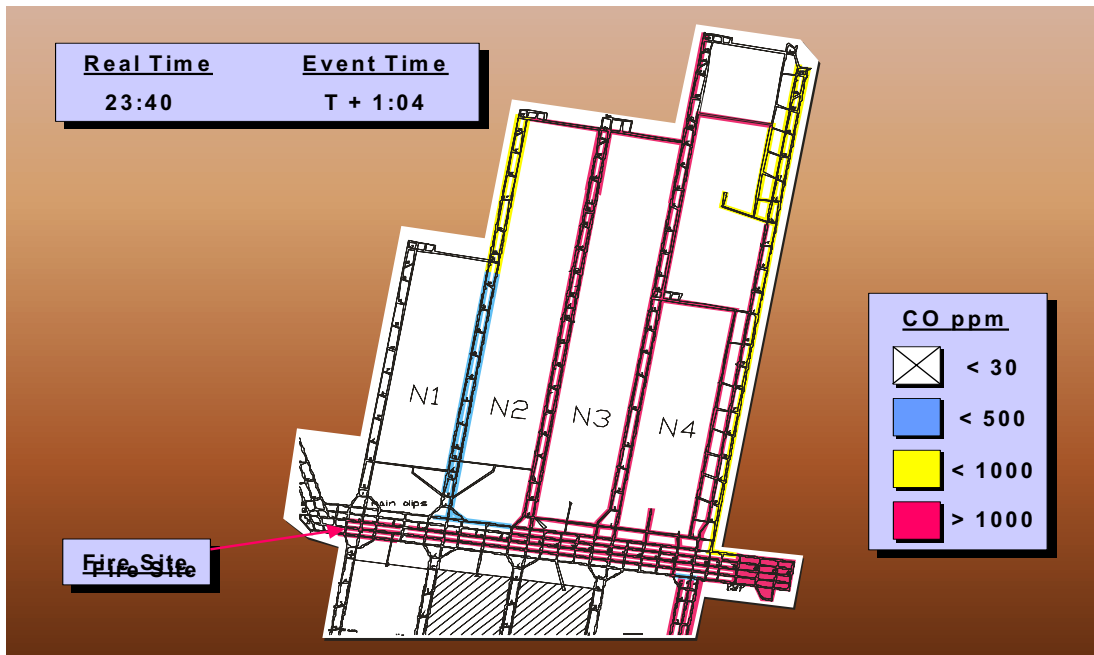
APPENDIX I – COMMUNICATION CHANNELS

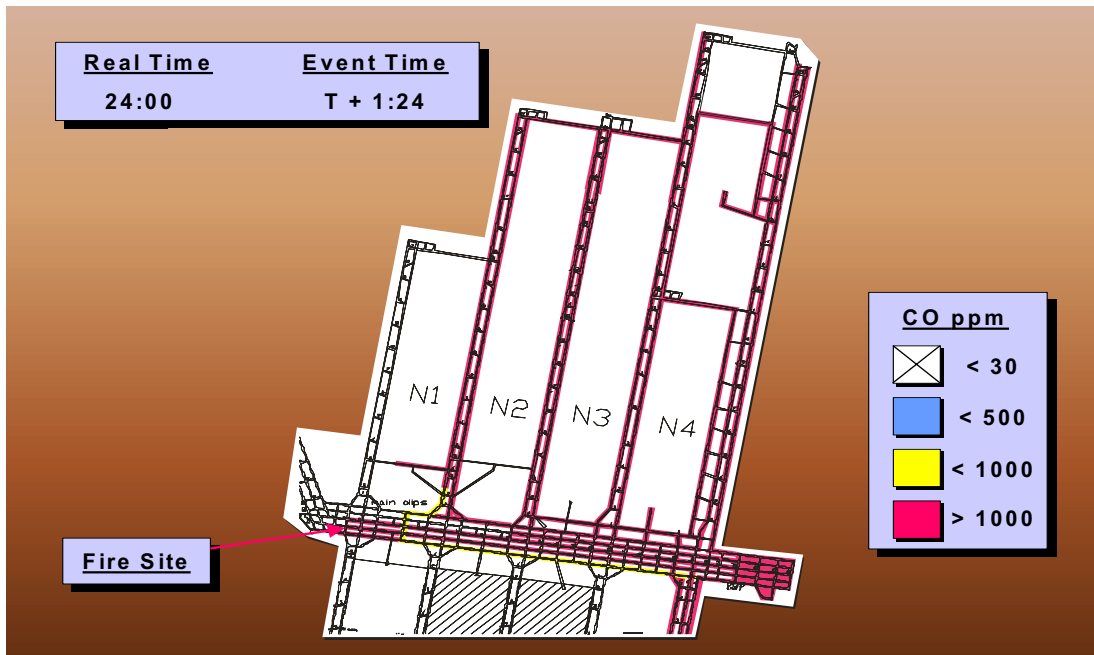


APPENDIX II - VENTILATION FLOW CHARTS









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APPENDIX III – REAL TIME SENSOR ALARMS AND ACKNOWLEDGEMENTS

				Alarm Status
25/11/00	2239	T2 LTU	CO HHPV	Unacknowledged
25/11/00	2239	T2 LTU	CO HPV	Unacknowledged
25/11/00	2240	T2 LTU	CO HHPV	Acknowledged – Unknown
25/11/00	2240	T2 LTU	CO HPV	Acknowledged – Unknown
25/11/00	2243	N4 LW D/HEAD	CO HHPV	Unacknowledged
25/11/00	2243	N4 LW D/HEAD	CO HPV	Unacknowledged
25/11/00	2243	N4 LW D/HEAD	CO HHPV	Acknowledged – Unknown
25/11/00	2243	N4 LW D/HEAD	CO HPV	Acknowledged – Unknown
25/11/00	2245	N4 MG LTU	CO HHPV	Unacknowledged
25/11/00	2245	N4 MG LTU	CO PHV	Unacknowledged
25/11/00	2245	N4 MG LTU	CO HHPV	Acknowledged – Unknown
25/11/00	2245	N4 MG LTU	CO HPV	Acknowledged – Unknown
25/11/00	2246	22 C/T PUMPS	CO HHPV	Unacknowledged
25/11/00	2246	22 C/T PUMPS	CO HPV	Unacknowledged
25/11/00	2246	22 C/T PUMPS	CO HHPV	Acknowledged – Unknown
25/11/00	2246	22 C/T PUMPS	CO HPV	Acknowledged – Unknown
25/11/00	2248	TRUNK BOOT END	CO HHPV	Unacknowledged
25/11/00	2248	TRUNK BOOT END	CO HPV	Unacknowledged
25/11/00	2249	TRUNK BOOT END	CO HHPV	Acknowledged – Unknown
25/11/00	2249	TRUNK BOOT END	CO PHV	Acknowledged – Unknown
25/11/00	2329	N2 Homotropical	CO HHPV	Unacknowledged
25/11/00	2329	N2 Homotropical	CO HPV	Unacknowledged
25/11/00	2329	N2 Homotropical	CO HHPV	Acknowledged – Unknown
25/11/00	2329	N2 Homotropical	CO HPV	Acknowledged – Unknown

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APPENDIX IV – TUBE BUNDLE ALARMS AND ACKNOWLEDGEMENTS

				Alarm Status
25/11/00	2309	N3 MG 1-2 C/T	CO HPV	Unacknowledged – Reading: 999, SetPoint: 5
25/11/00	2309	N3 MG 1-2 C/T	CO2 HPV	Unacknowledged – Reading: 65, SetPoint: .5
25/11/00	2310	N3 MG 1-2 C/T	CO HPV	Acknowledged – Unknown
25/11/00	2310	N3 MG 1-2 C/T	CO2 HPV	Acknowledged – Unknown
25/11/00	2310	N3 MG 1-2 C/T	CO HHPV	Acknowledged – Unknown
25/11/00	2326	D/E Hdg 24 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 4
25/11/00	2326	D/E Hdg 24 C/T	CO HPV	Unacknowledged – Reading: 999, SetPoint: 2
25/11/00	2326	D/E Hdg 24 C/T	CO2 HPV	Unacknowledged – Reading: .54, SetPoint: .5
25/11/00	2327	D/E Hdg 24 C/T	CO HHPV	Acknowledged – Unknown
25/11/00	2327	D/E Hdg 24 C/T	CO HPV	Acknowledged – Unknown
25/11/00	2327	D/E Hdg 24 C/T	CO2 HPV	Acknowledged – Unknown
25/11/00	2328	E Hdg 24-25 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 6
25/11/00	2328	E Hdg 24-25 C/T	CO HPV	Unacknowledged – Reading: 999, SetPoint: 3
25/11/00	2328	E Hdg 24-25 C/T	O2 LPV	Unacknowledged – Reading: 19.38, SetPoint: 19.5
25/11/00	2328	E Hdg 24-25 C/T	CO2 HPV	Unacknowledged – Reading: .89, SetPoint: .5
25/11/00	2328	E Hdg 24-25 C/T	CO HHPV	Acknowledged – Unknown
25/11/00	2328	E Hdg 24-25 C/T	CO HPV	Acknowledged – Unknown
25/11/00	2328	E Hdg 24-25 C/T	O2 LPV	Acknowledged – Unknown
25/11/00	2328	E Hdg 24-25 C/T	CO2 HPV	Acknowledged – Unknown
25/11/00	2342	E Hdg 24-25 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 8
25/11/00	2342	E Hdg 24-25 C/T	CO HPV	Unacknowledged – Reading: 999, SetPoint: 4
25/11/00	2342	E Hdg 24-25 C/T	O2 LPV	Unacknowledged – Reading: 12.94, SetPoint: 19.5
25/11/00	2342	E Hdg 24-25 C/T	CO2 HHPV	Unacknowledged – Reading: 5.64, SetPoint: 4
25/11/00	2342	E Hdg 24-25 C/T	CO2 HPV	Unacknowledged – Reading: 5.64, SetPoint: .5
25/11/00	2342	E Hdg 24-25 C/T	CO HHPV	Acknowledged – Unknown
25/11/00	2342	E Hdg 24-25 C/T	CO HPV	Acknowledged – Unknown
25/11/00	2342	E Hdg 24-25 C/T	O2 LPV	Acknowledged – Unknown
25/11/00	2342	E Hdg 24-25 C/T	CO2 HHPV	Acknowledged – Unknown
25/11/00	2342	E Hdg 24-25 C/T	CO2 HPV	Acknowledged – Unknown
25/11/00	2354	N3 MG 1-2 C/T	O2 LPV	Unacknowledged – Reading: 15.55, SetPoint: 19.5
25/11/00	2354	N3 MG 1-2 C/T	O2 LPV	Acknowledged – Unknown

				Alarm Status
25/11/00	2356	N4 A MG	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 10
25/11/00	2356	N4 A MG	CO HPV	Unacknowledged – Reading: 999, SetPoint: 5
25/11/00	2356	N4 A MG	O2 LPV	Unacknowledged – Reading: 18.01, SetPoint: 19.5
25/11/00	2356	N4 A MG	CO2 HHPV	Unacknowledged – Reading: 2.04, SetPoint: .5
25/11/00	2356	N4 A MG	CO2 HPV	Unacknowledged – Reading: 2.04, SetPoint: .2
25/11/00	2357	N4 A MG	CO HHPV	Acknowledged – Unknown
25/11/00	2357	N4 A MG	CO HPV	Acknowledged – Unknown
25/11/00	2357	N4 A MG	O2 LPV	Acknowledged – Unknown
25/11/00	2357	N4 A MG	CO2 HHPV	Acknowledged - Unknown
25/11/00	2357	N4 A MG	CO2 HPV	Acknowledged – Unknown
25/11/00	2359	N4 A TG 16-17 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 10
25/11/00	2359	N4 A TG 16-17 C/T	CO HPV	Unacknowledged – Reading: 999, SetPoint: 5
25/11/00	2359	N4 A TG 16-17 C/T	CO HHPV	Acknowledged – Unknown
25/11/00	2359	N4 A TG 16-17 C/T	CO HPV	Acknowledged – Unknown
25/11/00	0006	N2 MG B 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 4
26/11/00	0006	N2 MG B 1-2	CO HPV	Unacknowledged – Reading: 999, SetPoint: 3
26/11/00	0006	N2 MG B 1-2	O2 LPV	Unacknowledged – Reading: 17.36, SetPoint: 19.5
26/11/00	0006	N2 MG B 1-2	CO2 HPV	Unacknowledged – Reading: 2.46, SetPoint: .5
26/11/00	0006	N2 MG B 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0006	N2 MG B 1-2	CO PHV	Acknowledged – Unknown
26/11/00	0006	N2 MG B 1-2	O2 LPV	Acknowledged – Unknown
26/11/00	0006	N2 MG B 1-2	CO2 HHPV	Acknowledged – Unknown
26/11/00	0010	D / E Hdg 24 C/T	O2 LPV	Unacknowledged – Reading: 12.99, SetPoint: 19.5
26/11/00	0010	D / E Hdg 24 C/T	CO2 HHPV	Unacknowledged – Reading: 5.54, SetPoint: 19.5
26/11/00	0010	D / E Hdg 24 C/T	O2 LPV	Acknowledged – Unknown
26/11/00	0010	D / E Hdg 24 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0012	E Hdg 24 – 25 C/T	CH4 HHPV	Unacknowledged – Reading: 1.55, SetPoint: 1.25
26/11/00	0012	E Hdg 24 – 25 C/T	CO2 HHPV	Unacknowledged – Reading: 9.8, SetPoint: 4
26/11/00	0013	E Hdg 24 – 25 C/T	CH4 HHPV	Acknowledged – Unknown
26/11/00	0013	E Hdg 24 – 25 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0038	N3 MG 1-2 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 51
26/11/00	0038	N3 MG 1-2 C/T	CO HHPV	Acknowledged - Unknown

				Alarm Status
26/11/00	0042	N4 A TG 16-17 C/T	O2 LPV	Unacknowledged – Reading: 15.22, SetPoint: 19.5
26/11/00	0042	N4 A TG 16-17 C/T	CO2 HHPV	Unacknowledged – Reading: 3.91, SetPoint: .5
26/11/00	0042	N4 A TG 16-17 C/T	CO2 HPV	Unacknowledged – Reading: 3.91, SetPoint: .5
26/11/00	0043	N4 A TG 16-17 C/T	O2 LPV	Acknowledged – Unknown
26/11/00	0043	N4 A TG 16-17 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0054	N4 A TG 16-17 C/T	CO2 HPV	Acknowledged – Unknown
26/11/00	0054	D/E Hdg 24 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 4
26/11/00	0056	D/E Hdg 24 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0056	E Hdg 24-25 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 6
26/11/00	0110	E Hdg 24-25 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0110	E Hdg 24-25 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 8
26/11/00	0110	E Hdg 24-25 C/T	CO2 HHPV	Unacknowledged – Reading: 5.62, SetPoint: 4
26/11/00	0110	E Hdg 24-25 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0110	E Hdg 24-25 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0117	S1 TG SEAL	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 150
26/11/00	0117	S1 TG SEAL	CO HPV	Unacknowledged – Reading: 999, SetPoint: 100
26/11/00	0118	S1 TG SEAL	CO HHPV	Acknowledged – Unknown
26/11/00	0118	S1 TG SEAL	CO HPV	Acknowledged – Unknown
26/11/00	0119	S2 TG 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 150
26/11/00	0119	S2 TG 1-2	CO HPV	Unacknowledged – Reading: 999, SetPoint: 100
26/11/00	0119	S2 TG 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0119	S2 TG 1-2	CO HPV	Acknowledged – Unknown
26/11/00	0121	N3 MG 1-2 C/T	CO2 HHPV	Unacknowledged – Reading:4.04, SetPoint: 4
26/11/00	0122	N3 MG 1-2 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0124	N4 A MG	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 10
26/11/00	0124	N4 A MG	CO2 HHPV	Unacknowledged – Reading: 4.03, SetPoint: .5
26/11/00	0124	N4 A MG	CO HHPV	Acknowledged – Unknown
26/11/00	0124	N4 A MG	CO2 HHPV	Acknowledged – Unknown
26/11/00	0126	N4 A TG 16-17 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 10
26/11/00	0126	N4 A TG 16-17 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0133	N2 MG B 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 4
26/11/00	0133	N2 MG B 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0135	S3 TG B 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint:90
26/11/00	0135	S3 TG B 1-2	CO HPV	Unacknowledged – Reading: 999, SetPoint: 85
26/11/00	0135	S3 TG B 1-2	O2 HPV	Unacknowledged – Reading: 6, SetPoint: 5
26/11/00	0135	S3 TG B 1-2	CO2 HHPV	Unacknowledged – Reading: 10.6, SetPoint: 10

				Alarm Status
26/11/00	0135	S3 TG B 1-2	CO2 HPV	Unacknowledged – Reading: 10.6, SetPoint: 10
26/11/00	0135	S3 TG B 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0135	S3 TG B 1-2	CO HPV	Acknowledged – Unknown
26/11/00	0135	S3 TG B 1-2	O2 HPV	Acknowledged – Unknown
26/11/00	0135	S3 TG B 1-2	CO2 HHPV	Acknowledged – Unknown
26/11/00	0135	S3 TG B 1-2	CO2 HPV	Acknowledged – Unknown
26/11/00	0137	D/E Hdg 24 C/T	CO2 HHPV	Unacknowledged – Reading: 5.78, SetPoint: 4
26/11/00	0138	D/E Hdg 24 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0140	E Hdg 24-25 C/T	CH4 HHPV	Unacknowledged – Reading: 1.58, SetPoint, 1.25
26/11/00	0140	E Hdg 24-25 C/T	CO2 HPV	Unacknowledged – Reading: 10.2, SetPoint: 4
26/11/00	0140	E Hdg 24-25 C/T	CH4 HHPV	Acknowledged – Unknown
26/11/00	0140	E Hdg 24-25 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0149	S4 TG 13-14 B SEAL	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 90
26/11/00	0149	S4 TG 13-14 B SEAL	CO HPV	Unacknowledged – Reading: 999, SetPoint: 85
26/11/00	0149	S4 TG 13-14 B SEAL	CH4 LPV	Unacknowledged – Reading: .06, SetPoint: 15
26/11/00	0149	S4 TG 13-14 B SEAL	CO HHPV	Acknowledged – Unknown
26/11/00	0149	S4 TG 13-14 B SEAL	CO HPV	Acknowledged – Unknown
26/11/00	0149	S4 TG 13-14 B SEAL	CH4 LPV	Acknowledged – Unknown
26/11/00	0205	N3 MG 1-2 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 51
26/11/00	0205	N3 MG 1-2 C/T	CO3 HHPV	Cleared
26/11/00	0205	N3 MG 1-2 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0209	N4 A TG 16-17 C/T	CO2 HHPV	Unacknowledged – Reading: 4.13, SetPoint: 5
26/11/00	0210	N4 A TG 16-17 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0219	S3 TG B 1-2	O2 HHPV	Unacknowledged – Reading: 6.4, SetPoint: 6.3
26/11/00	0219	S3 TG B 1-2	CO2 HHPV	Cleared
26/11/00	0219	S3 TG B 1-2	CO2 HPV	Cleared
26/11/00	0219	S3 TG B 1-2	O2 HHPV	Acknowledged – Unknown
26/11/00	0221	D/E Hdg 24 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 4
26/11/00	0221	D/E Hdg 24 C/T	CO HHPV	Acknowledged - Unknown
26/11/00	0223	E Hdg 24-25 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 6

				Alarm Status
26/11/00	0223	E Hdg 24-25 C/T	CH4 HHPV	Cleared
26/11/00	0223	E Hdg 24-25 C/T	CH4 HPV	Cleared
26/11/00	0223	E Hdg 24-25 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0232	S4 TG 13-14 B SEAL	O2 HPV	Unacknowledged – Reading: 11, SetPoint: 10
26/11/00	0233	S4 TG 13-14 B SEAL	O2 HPV	Acknowledged – Unknown
26/11/00	0237	E Hdg 23-24 C/T	CO HHPV	Unacknowledged – Reading, 999, SetPoint: 8
26/11/00	0237	E Hdg 23-24 C/T	CO2 HHPV	Unacknowledged – Reading: 5.79, SetPoint: 4
26/11/00	0238	E Hdg 23-24 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0238	E Hdg 23-24 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0244	S1 TG SEAL	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 150
26/11/00	0245	S1 TG SEAL	CO HHPV	Acknowledged - Unknown
26/11/00	0246	S2 TG 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 150
26/11/00	0246	S2 TG 1-2	O2 HHPV	Unacknowledged – Reading: 19, SetPoint: 10
26/11/00	0246	S2 TG 1-2	O2 HPV	Unacknowledged – Reading 19, SetPoint: 8
26/11/00	0246	S2 TG 1-2	CO HHPV	Acknowledged – Sim
26/11/00	0246	S2 TG 1-2	O2 HHPV	Acknowledged – Sim
26/11/00	0246	S2 TG 1-2	O2 HPV	Acknowledged – Sim
26/11/00	0251	N4 A MG	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 10
26/11/00	0251	N4 A MG	CO2 HHPV	Unacknowledged – Reading: 3.95, SetPoint: .5
26/11/00	0252	N4 A MG	CO HHPV	Acknowledged – Unknown
26/11/00	0252	N4 A MG	CO2 HHPV	Acknowledged – Unknown
26/11/00	0253	N4 A TG 16-17 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 10
26/11/00	0254	N4 A TG 16-17 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0258	N3 MG 1-2 C/T	O2 LPV	Cleared
26/11/00	0258	N3 MG 1-2 C/T	CO2 HPV	Cleared
26/11/00	0300	N3 MG 1-2 C/T	O2 LPV	Unacknowledged – Reading: 19.26, SetPoint: 19.5
26/11/00	0300	N3 MG 1-2 C/T	CO2 HPV	Unacknowledged – Reading: 1.16, SetPoint: .5
26/11/00	0300	N3 MG 1-2 C/T	O2 LPV	Acknowledged – Unknown
26/11/00	0300	N3 MG 1-2 C/T	CO2 HPV	Acknowledged – Unknown
26/11/00	0302	N3 MG 1-2 C/T	O2 LPV	Cleared
26/11/00	0302	N3 MG 1-2 C/T	CO2 HPV	Cleared
26/11/00	0316	N2 MG B 1-2	CO HHPV	Unacknowledged – Reading: 230, SetPoint: 4
26/11/00	0316	N2 MG B 1-2	O2 LPV	Cleared
26/11/00	0316	N2 MG B 1-2	CO2 HPV	Cleared

				Alarm Status
26/11/00	0316	N2 MG B 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0318	S3 TG B 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 90
26/11/00	0318	S3 TG B 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0320	D/E Hdg 24 C/T	CO2 HHPV	Cleared
26/11/00	0323	E Hdg 24-25 C/T	CO2 HHPV	Cleared
26/11/00	0332	S4 TG 13-14 B SEAL	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 90
26/11/00	0332	S4 TG 13-14 B SEAL	O2 HHPV	Unacknowledged – Reading: 15.4, SetPoint: 12
26/11/00	0332	S4 TG 13-14 B SEAL	CO HHPV	Acknowledged – Unknown
26/11/00	0332	S4 TG 13-14 B SEAL	O2 HHPV	Acknowledged – Unknown
26/11/00	0343	S1 TG SEAL	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 150
26/11/00	0343	S1 TG SEAL	O2 HPV	Unacknowledged – Reading: 11, SetPoint: 10
26/11/00	0343	S1 TG SEAL	CO HHPV	Acknowledged – Unknown
26/11/00	0343	S1 TG SEAL	O2 HPV	Acknowledged – Unknown
26/11/00	0348	N3 MG 1-2 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 51
26/11/00	0348	N3 MG 1-2 C/T	O2 LPV	Unacknowledged – Reading: 11, SetPoint: 19.5
26/11/00	0348	N3 MG 1-2 C/T	CO2 HHPV	Unacknowledged – Reading: 5.41, SetPoint: 4
26/11/00	0348	N3 MG 1-2 C/T	CO2 HPV	Unacknowledged – Reading, 5.41, SetPoint: .5
26/11/00	0348	N3 MG 1-2 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0348	N3 MG 1-2 C/T	O2 LPV	Acknowledged – Unknown
26/11/00	0348	N3 MG 1-2 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0348	N3 MG 1-2 C/T	CO2 HPV	Acknowledged – Unknown
26/11/00	0352	N4 A TG 16-17 C/T	CO2 HHPV	Unacknowledged – Reading: 5.4, SetPoint: .5
26/11/00	0352	N4 A TG 16-17 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0359	N2 MG B 1-2	O2 LPV	Unacknowledged – Reading: 18.45, SetPoint: 19.5
26/11/00	0359	N2 MG B 1-2	CO2 HPV	Unacknowledged – Reading: 1.76, SetPoint: .5
26/11/00	0359	N2 MG B 1-2	O2 LPV	Acknowledged – Unknown
26/11/00	0359	N2 MG B 1-2	CO2 HPV	Acknowledged – Unknown
26/11/00	0401	S3 TG B 1-2	O2 HHPV	Unacknowledged – Reading: 13.18, SetPoint: 6.3
26/11/00	0402	S3 TG B 1-2	O2 HHPV	Acknowledged – Unknown
26/11/00	0404	D/E Hdg 24 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 4
26/11/00	0404	D/E Hdg 24 C/T	CO2 HHPV	Unacknowledged – Reading: 5.4, SetPoint: 4

				Alarm Status
26/11/00	0404	D/E Hdg 24 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0404	D/E Hdg 24 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0406	E Hdg 24-25 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 6
26/11/00	0406	E Hdg 24-25 C/T	CO2 HHPV	Unacknowledged – Reading: 5.4, SetPoint: 4
26/11/00	0406	E Hdg 24-25 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0406	E Hdg 24-25 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0420	E Hdg 24-25 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 8
26/11/00	0420	E Hdg 24-25 C/T	CO2 HHPV	Unacknowledged – Reading: 8.02, SetPoint: 4
26/11/00	0420	E Hdg 24-25 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0420	E Hdg 24-25 C/T	CO2 HHPV	Acknowledged – Unknown
26/11/00	0429	S2 TG 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 150
26/11/00	0429	S2 TG 1-2	O2 HHPV	Unacknowledged – Reading: 13.18, SetPoint: 10
26/11/00	0429	S2 TG 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0429	S2 TG 1-2	O2 HHPV	Acknowledged – Unknown
26/11/00	0431	N3 MG 1-2 C/T	CO2 HHPV	Cleared
26/11/00	0433	N4 A MG	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 10
26/11/00	0433	N4 A MG	CO2 HHPV	Unacknowledged – Reading: 5.42, SetPoint: .5
26/11/00	0434	N4 A MG	CO HHPV	Acknowledged – Unknown
26/11/00	0434	N4 A MG	CO2 HHPV	Acknowledged – Unknown
26/11/00	0436	N4 A TG 16-17 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 10
26/11/00	0437	N4 A TG 16-17 C/T	CO HHPV	Acknowledged – Unknown
26/11/00	0442	N2 MG B 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 4
26/11/00	0443	N2 MG B 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0445	S3 TG B 1-2	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 90
26/11/00	0445	S3 TG B 1-2	CO HHPV	Acknowledged – Unknown
26/11/00	0449	E Hdg 24-25 C/T	CO2 HHPV	Cleared
26/11/00	0458	S4 TG 13-14 B SEAL	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 90
26/11/00	0458	S4 TG 13-14 B SEAL	O2 HHPV	Unacknowledged – Reading: 19, SetPoint: 12
26/11/00	0459	S4 TG 13-14 B SEAL	CO HHPV	Acknowledged – Unknown
26/11/00	0459	S4 TG 13-14 B SEAL	O2 HHPV	Acknowledged – Unknown
26/11/00	0503	E Hdg 23-24 C/T	CO2 HHPV	Cleared
26/11/00	2255	E Hdg 23-24 C/T	CH4 HHPV	Unacknowledged – Reading: 1.5, SetPoint: 1.25

				Alarm Status
26/11/00	2255	E Hdg 23-24 C/T	CH4 HPV	Unacknowledged – Reading: 1.5, SetPoint: 1
26/11/00	2310	E Hdg 23-24 C/T	CH4 HHPV	Acknowledged – Sim
26/11/00	2310	E Hdg 23-24 C/T	CH4 HPV	Acknowledged – Sim
26/11/00	2320	N3 MG 1-2 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 51
26/11/00	2320	N3 MG 1-2 C/T	CO HPV	Unacknowledged – Reading: 999, SetPoint: 5
26/11/00	2320	N3 MG 1-2 C/T	O2 LPV	Unacknowledged – Reading: 15.37, SetPoint: 19.5
26/11/00	2320	N3 MG 1-2 C/T	CO2 HPV	Unacknowledged – Reading: 3.9, SetPoint: .5
26/11/00	2244	E Hdg 24-25 C/T	CH4 HHPV	Unacknowledged – Reading: 1.5, SetPoint: 1.25
26/11/00	2244	E Hdg 24-25 C/T	CH4 HPV	Unacknowledged – Reading: 1.5, SetPoint: 1
26/11/00	2244	E Hdg 24-25 C/T	CH4 HHPV	Acknowledged – Unknown
26/11/00	2244	E Hdg 24-25 C/T	CH4 HPV	Acknowledged – Unknown
26/11/00	2309	N3 MG 1-2 C/T	CO HHPV	Unacknowledged – Reading: 999, SetPoint: 51

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APPENDIX V - THE EXERCISE MANAGEMENT TEAM

Greg Rowan

Starting in the mining industry in 1978 and joining the Qld Mines Rescue Service in 1979, Greg has worked as a miner, undermanager, mine manager, project manager and in private consultancy at different operations in Queensland and Western Australia. Recruited to the Queensland Department of Mines and Energy in 1997, Greg currently holds the position of Senior Inspector of Mines and has been Chairman of the Queensland Emergency Exercise Management Committee since its formation in 1998.

Greg holds a First Class Coal Mine Managers Certificate, has post-graduate qualifications in management (GCM) and business administration (GDipBA) and is a certificated Management System Lead Auditor.

Greg is the Queensland chief examiner for coal mine manager's certificates, sits on the Australian National Coal Sector Steering Committee, was awarded the 1999 International NEDO sponsorship and is a Fellow of the Australasian Institute of Mining and Metallurgy.

Murray Bird

Murray joined the underground coal mining industry in 1974 as a Trainee Mining Engineer in the BHP Southern NSW Coal Division. After obtaining Statutory Underground Coal Mining Certificates, he was appointed as a Deputy at Corrimal Colliery, Undermanager and Undermanager-In-Charge at Nebo Colliery, Deputy Manager at Old Bulli Colliery and Group Relieving Manager for the BHP Southern Coal Division.

Murray was appointed as Superintendent at Hunter Valley Mines Rescue Station in 1986 and was appointed Manager of the Newcastle Mines Rescue Station in 1994. Currently he holds the position of Chief Executive, NSW Mines Rescue Service which he has held since 1998.

Rescue based qualifications include Underground Mines Rescue, Open-cut Mines Rescue, Coal Mine Fire Officer, Police Rescue Operator, Vertical Rope Instructor, PADI Open Water Instructor, Class 3 Commercial Diver and NATA Auditor.

Greg Dalliston

Greg has been involved in the mining industry for 26 years, and has gained experience in numerous areas. He started his career as a Cadet Mine Manager with the Queensland Coal Association, before working in a variety of positions within the industry, including 8 years as a mine Deputy.

Greg is employed as a District Union Inspector to manage health, safety and training for the Construction, Forestry, Mining and Energy Union (CFMEU), Mining and Energy Division, a position which he has held for the last 8 years.

Some of the roles pertaining to this position have included:

Participating in tripartite industry committees to develop new Safety and Health legislation for the Queensland Coal Industry;

Member of State and National training committees for the mining industry;

Perform safety audits and inspections at mines throughout Queensland;

Investigating serious and fatal mining accidents, assisting the Mining Warden as a reviewer into mining accidents;

Member of Incident Management Teams at significant incidents, including the 1994 Moura No. 2 disaster; Performing debriefs after incidents and providing critical incident management services; and

Development of Manager, Undermanager and Deputy Statutory National Competency Standards, including Risk Management and Emergency Response

Gavin Taylor

Gavin commenced work in the coal industry in the Illawarra Coalfields of New South Wales in 1967. He studied Mining at the Wollongong TAFE College and has a Certificate and Associate Diploma in Coal Mining.

Gavin currently holds Third, Second and First Class Certificates of Competency and also a Certificate of Competency in Mines Rescue. Currently he is employed at BHP Crinum Mine as the Registered Mine Manager and he has been employed at Crinum Mine since October 1993.

Malcolm Smith

Malcolm was born and educated in Yorkshire, England. Malcolm commenced his mining career with the National Coal Board, Great Britain on completion of mining courses at Manvers Training Centre and Mexbro Technical College.

Malcolm became an active volunteer mine rescue team member attached to the Rotherham Central Mines Rescue Station of the National Coal Board, South Yorkshire and was appointed as a full-time Mines Rescue Brigadesman, Rotherham Central Mines Rescue Station.

After emigrating to Canada, he began working with McIntyre Mines in Alberta where he initiated the McIntyre Mines, Coal Division district mine rescue competitions for surface and underground mines and trained four Alberta Provincial winning teams. In March 1987, he accepted the appointment of Manager Mine Rescue with the Ontario Ministry of Labour, Ontario Mine Rescue Organisation in Canada and in August 1999, accepted the appointment of Chief Executive Officer, with the Queensland Mines Rescue Service Ltd.

Brian Lyne

Brian was appointed as Chief Inspector of Coal Mines for the Queensland Department of Mines and Energy in October 1989. He has had extensive experience in control of spontaneous combustion, underground mine fires and recovery of mine after a major underground explosion. This experience also spans some 17 years management experience of underground coal mines in Newcastle, Singleton and the Cessnock coalfields which covers shaft mines, portal entries, cross measure drifts and adits.

Brian holds a degree in Mining Engineering from the University of NSW, a First Class Mine Manager's certificate for both Queensland and NSW, and has 27 years experience in Mines Rescue. Brian also chaired Task Group 5 from the Moura No. 2 Inquiry that introduced the GAG inertisation system and mine ventilation control device standards.

Peter Baker

Peter is currently employed by the Mines Rescue Service NSW as Manager – Southern Mines Rescue Station. He commenced working in the mining industry in 1980 and has held various positions, including Undermanager in Charge and Relief Manager. He assisted in the development

of emergency procedures at Appin and Tahmoor Collieries and audits minesite emergency plans in his current role.

He has been in Mines Rescue since 1986 and was appointed Captain in 1988. Whilst a trainee, he represented the station as Competition Team Captain at the Australian Underground Championships. Peter holds a Master of Business and Technology Degree, a Mining Engineering Degree, Coal Mining Third, Second and First Class Ticket, Underground Mines Rescue Certificate, Train the Trainer Certificate and has completed the CMQB Emergency Preparedness Course.

Neville Kathage

Neville currently holds the position of Laboratory Technical Assistant with the Mining Research Centre, SIMTARS. He has had extensive experience within the industry in the following positions: 10 years as a coal mine Deputy, 5 years as an underground miner, 4 years working dredge / washplant / opencut mining, 3 years working with earth moving equipment / stockpiles and 5 years working with coal testing and mining research.

Norm Gow

At the time of the exercise, Norm was an Inspector of Mines with the Department of Mines and Energy based in the Mackay Office. Norm has been with the coal mining industry for approximately 33 years, including 18 years experience mine management experience and 3 years as a coal company General Manager. Norm's mines rescue experience covers an extensive period with 10 years as a trainee with the Newcastle Mines Rescue Station, including representation in inter-district rescue competitions and participation in the recovery process after sealing of Burwood Colliery following fire and West Wallsend No. 2 Colliery after an explosion. Norm is also a certified Quality Management Systems Auditor.

David Cliff

At the time of the exercise, David was the Health and Safety Adviser at the Queensland Mining Council. Prior to that he spent over 10 years at SIMTARS, the last three as Manager, Mining Research Centre where he was responsible for directing the research effort of SIMTARS. He was actively involved in promoting the awareness of hazards in the mining industry, principally focussing on the prevention of fires and explosions and health and safety promotion. He has been actively involved in spontaneous combustion research since 1989 and has investigated a number of mine fires and spontaneous combustion episodes.

David's qualifications include: a Bachelor of Science Degree (Honours) from Monash University, a Doctor of Philosophy from Cambridge University and post-graduate studies in Environmental Studies, Outdoor Education and Business Administration. He is a member and chartered Chemist of the Royal Australian Chemical Institute – Environmental Chemistry Section, a Member of the Combustion Institute, Member of the Safety Institute of Australia, President of the Queensland Branch of the Clean Air Society and a Member of the Australasian Institute of Mining and Metallurgy.

Jan Oberholzer

Jan is currently the Manager for the Mining Research Centre at SIMTARS. He holds a Bachelor of Science, Mining Engineering, Master of Science, Mining Engineering and a PhD in Mining Engineering. Jan has been employed in the Mining Industry in various roles and countries since 1972 when he commenced employment at Coalbrook Colliery as a Graduate Engineer-In-Training.

The areas of activity that Jan currently looks after in his role as Manager, Mining Research Centre are: frictional ignitions, explosions, testing of coal hybrid mixtures, training enhancements, emergency exercises, the use of self contained self rescuers, the testing of underground structures in a destructive and non-destructive means, heat stress in coal mines and risk assessment training.

Jason Thomas

Jason is currently employed as the Senior Longwall Engineering Adviser at Newlands Colliery. Jason holds a Bachelor Degree in Mining Engineering and a Third Class and Second Class Certificate of Competency. Jason has been employed in the coal mining industry since 1992.

Murray Wood

Currently the Mine Manager at Oaky No.1 Mine, Oaky Creek Coal, Murray commenced working underground in 1981 completing a mine management traineeship in 1983. Murray worked as an underground operator in 1984 - 1985 at Capcoal's Central Colliery gaining a Second Class Mine Manager's Certificate of Competency during that time. In May 1985 Murray took up the position of shift undermanager at Central Colliery and in 1987 successfully gained a First Class Mine Manager's Certificate of Competency. In 1991, Murray took up the position of Shift Undermanager

at Gordonstone Mine and then held various mid-management positions through to January 1997 at which time he was appointed Mine Manager.

In November 1997, Murray left Gordonstone to take up his current position

Murray has been an active member of Mines Rescue 1982 - 1995 and participated in the initial development of the new Qld Coal Mining Safety and Health Regulations that are now in force.¹

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