Level One Emergency Exercise Report

5 November 2013

Ensham Coal Mine

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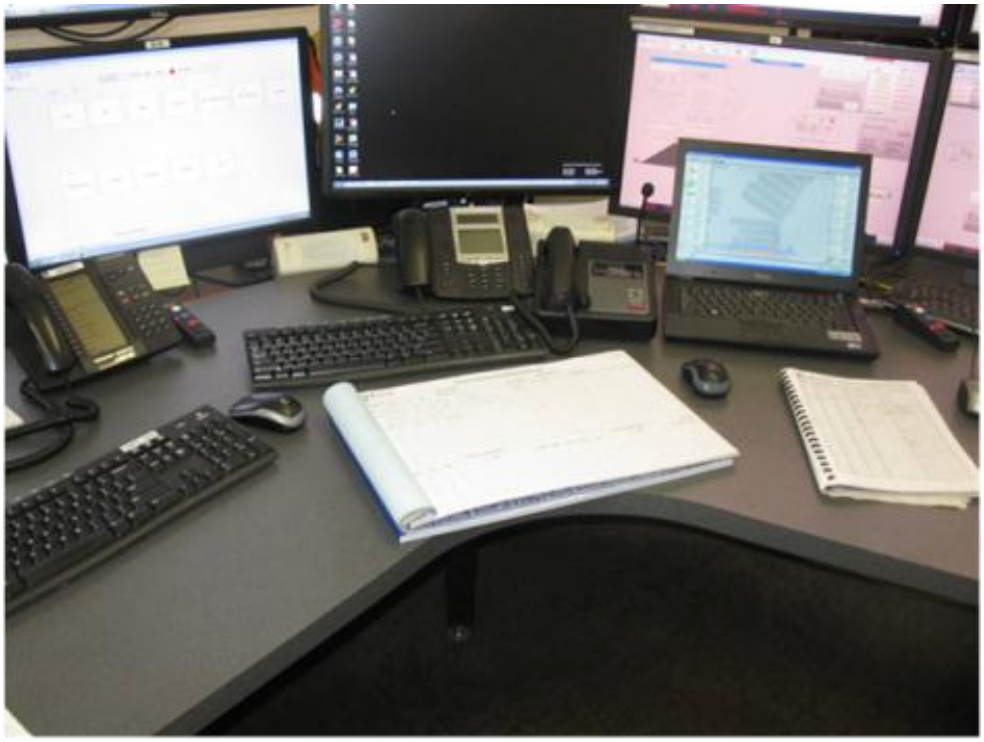


Image 1: Safegas simulation computers

Preface

This report has been compiled by the 2013 Level 1 Organising Committee with input provided by each of the assessors involved in the exercise. Assessors have provided an account of their part of the exercise for this report.

The organising committee would like to thank the assessors for their input and acknowledge the co-operation and assistance of all those involved in the 2013 level 1 mine emergency exercise.

Image 2: **Assessors in PJB**

Summary

This report covers the 2013 level 1 mine emergency exercise held at Ensham Coal Mine between 9.00 am and 5.00 pm on 5 November 2013. Assessors monitor the emergency response in its entirety as a basis for recommendations and follow-up on what was learned during the exercise.

The Queensland Mining Warden's inquiry into the explosion at the Moura No. 2 Mine in August 1994 recommended "Emergency procedures should be exercised at each mine on a systematic basis, the minimum requirement being on an annual basis for each mine." (Windridge et al. 1996).

In December 1996, the Approved Standard for the Conduct of Emergency Procedures Exercises was published. This approved standard was updated and issued as Recognised Standard 08 Conduct of Mine Emergency Exercises in June 2009. It provides guidelines for conducting mine site emergency exercises including the requirement for a test of state-wide emergency response by holding a level 1 mine emergency exercise at a mine annually.

Since 1998, sixteen level 1 mine emergency exercises have been held in Queensland.

Ensham Coal Mine is an underground bord and pillar coal mine producing high energy low ash thermal coal and is located approximately 40 km north east of Emerald and approximately 200 km west of Rockhampton in Central Queensland (see Image 4).

Scenario for 2013 exercise

A driver of a PJB vehicle had a heart attack, crashing the vehicle into the rib side of the men and materials drift. The passenger inside is dazed as a result of the accident. The driver collapsed outbye (up wind) of the vehicle while trying to get out. As the passenger goes to raise the alarm he notices the vehicle is on fire.

For this scenario it was decided that:

- the driver would succumb to the heart attack and die
- any reasonable fire fighting response would put the fire out, however the pollutants within the mine would always remain above 100 ppm of carbon monoxide (CO). This is an irrespirable atmosphere requiring any search and recovery operation to involve the Queensland Mines Rescue Service (QMRS)
- during the mine evacuation, one person would be lost in the South East 2 Panel.

Objectives

The objectives of the exercise were to test:

1. self-escape capability including the changeover process deployed from self-contained self-rescuers (SCSRs) to compressed breathing apparatus (CABA)
2. Incident Management Team (IMT) processes
3. mine personnel interaction with outside agencies, particularly police
4. QMRS response deployment and search and recovery.

Major conclusions

1. All aspects of the mine's response was professionally conducted, demonstrating the mine's commitment to the Mine Emergency Management System process.
2. The initial response to the vehicle crash and fire was excellent, proving that in a real event the fire would have been extinguished and smoke quickly cleared from the mine.
3. The mine staff involved at the accident site had very good knowledge of fire fighting procedures and resuscitation.
4. There were delays in the QMRS attending the site and being deployed underground.
5. The mines inspector and Police representative coordinated their interactions with IMT including the accident investigation.
6. The mine evacuation was completed in a timely manner with a couple of issues noted on donning SCSRs and the changeover process from SCSR to CABA.
7. Some confusion was observed when the smoke hazard simulation continued to affect mine workings after the fire was successfully extinguished. While the IMT identified several options to address the smoke hazard, it was deemed necessary to maintain an irrespirable atmosphere within the mine in order to test QMRS deployment. As part of the debriefing process, it was agreed scenarios be reviewed to ensure a viable and realistic response for the whole exercise.
8. There was a lack of urgency displayed by QMRS and sometimes within the IMT. This could have been created by the fact that the 'fire' was out.

Recommendations

Ensham Coal Mine

- Investigate the cause of CABA no 45 not recharging with air, inform the Mines Inspectorate of the identified cause and ensure the fault is not present in other suits.
- Investigate whether there are any issues relating to the recharge station at 10 cut-through (c/t) or if refresher training is required.
- Reconsider the procedure relating to dealing with external agencies such as Police.
- Have cap lamps and rescuers available in the workshop, which is located at the surface near the portal area. This will ensure people working there have access to them at all times so they can assist within the mine if there is an emergency.
- Review training in the donning, wearing and changeover of SCSRs to CABA to all underground mine workers.
- Ensure plans given to QMRS teams are reviewed by people familiar with the area to ensure the route of travel is achievable and progress won't be stopped by known water, stowage, falls, solid stoppings or other obstacles.
- There needs to be a protocol that can be invoked to ensure that the personnel tracking system is functioning properly with all nodes in operation and this should be checked off so all workers at the site can be identified. Mine should consider having a personnel tracking screen available for the IMT to view.
- Review the location of IMT break out rooms to ensure sensitive information, such as the identity of the people involved in the incident is not accessible to those not involved in managing the incident.
- Restrict the number of people in the IMT meetings to those directly engaged in the active management of the incident and direct all other personnel to allocated emergency assembly points.
- Develop a system/procedure relating to the underground tag board, specifically dealing with assessing the identification of individuals and their location.
- Reconsider the procedures regarding security/dissemination of information relating to any on site fatalities.
- All press statements be provided on company letterhead and coordinated by the authorised media officer
- Security boom gates to have a manual override system in place for each gate, incoming and outgoing, during a lockdown period.
- Large sign to advise of a lockdown situation for traffic to see and not overload security personnel.

Industry

- When placing sentries (ie authorised officers) at strategic locations in an emergency, ensure they are familiar with how to use available communications equipment.
- Continue regular training for coal mine workers (CMWs) in the donning of SCSRs.
- Continue regular training for CMWs in the changeover process from SCSR to CABA.
- Consult with Inspectorate and the Queensland Police Service regarding the emergency powers of each entity and provide this information to Industry. (Ensure that protocols managing interactions with external agencies such as the Queensland Police Service are in place for emergency response. Initiate interaction with external agencies to gain mutual understanding of process and accountabilities outside of an emergency event).
- The role of control room operator (CRO) should be a recognised competency with formal skills and experience requirements (this should not be taken as a criticism of the CRO operation at this exercise).
- Standardised process for changing from one CABA unit to another in the situation where one fails.

- Identify areas for CMWs to be located when they have evacuated from underground in an emergency.
- Improve debrief and briefings for CMWs during an emergency.
- Ensure control rooms have enough people to manage communications in an emergency event.
- Consider installation of underground cameras to assist with data collection and remote monitoring of mine areas and functions including access and egress at the portal, control room computer screens, emergency escapeways and other strategic locations.
- Have the appropriate person to give a full and accurate briefing to QMRS officers upon their arrival to expedite deployment.
- Implement MRAS to assist when QMRS arrive on site, with information/incident questions answered.
- Emergency Management Hazard Management Plans (HMP) should include definition of emergency management training requirements in more than motherhood statements.
- Consider having access to mine systems such as CITEC in IMT or operations areas.
- Review emergency response systems to ensure the identities of those involved in the event are controlled to allow appropriate next of kin (NOK) notification processes to occur.
- Review emergency response systems to ensure that emergency hotlines such as the Mines Inspectorate Hotline are used in an emergency.
- Recognised Standard 08 Conduct of Mine Emergency Exercises identifies the need for possible press involvement, therefore all mines and mining companies should prepare adequate documentation/information resources to issue to the press at a time of crisis.
- Mines and mining companies should review the need to be able to respond to social media posts during a time of crisis.
- Continue to support staff in all areas at the mine site and check points and keep all lines of communication open, simple and precise.

QMRS

- Instil a sense of urgency for lives at risk situations in training activities.
- Ensure officers are able to recognise opportunities to increase efficiency by running parallel tasks.
- Ensure team communications always go through the Fresh air base (FAB).
- Ensure FAB training highlights the importance of making standby teams active immediately when an active team is overdue.
- Consider briefing all team members in a single briefing to save time and ensure a common operating picture is maintained. Captains can then be given mine plan specific instructions.
- Send multiple teams active to enlarge the search box whenever possible.
- There should be an investigation into the factors that caused a delay in the deployment of the QMRS teams. It would appear that there was a delay in mobilising the teams, but also once the teams arrived on site it took some hours to get them underground. This should include an adoption of the MRAS system if necessary.

Exercise team

- Continued use of real SCSRs gives CMWs an excellent experience.
- Continue to use the mine's CABAs and sight impaired goggles, as they give a more realistic feel to the exercise.
- Use of audio recording equipment to capture communications in the control room.
- Mechanisms for direct communication between key locations for assessors should be investigated – e.g. between exercise coordinator and incident site, or between the

exercise coordinator and particular assessors. This would allow independent reporting of the status of the incident and progress in establishing control.

- The need for QMRS callout should be reviewed; there may need to be an alternative process invoked to prevent the scenario from becoming too artificial.
- Provide resources to allow role playing of NOK to test appropriate notification processes in place at mines.
- Review scenarios as part of the debriefing process to ensure a viable and realistic response for the whole exercise, noting some confusion occurred when the smoke hazard simulation continued to affect mine workings after the fire was effectively and quickly extinguished. This occurred as it was deemed necessary to maintain an irrespirable atmosphere within the mine in order to test QMRS deployment.
- The exercise team should review the opportunity for further press/media involvement during level 1 mine emergency exercises to ensure that the timely and accurate information is made available to their corporate headquarters. As part of this review social media posts should also be considered.

The 2014 Queensland level 1 mine emergency exercise will be held at Kestrel Extension Mine.

Martin Watkinson

Chair 2013 Level 1 Mine Emergency Exercise Executive Management Committee

Image 3: Ensham Coal Mine stockpile

Introduction

This report covers the 2013 level 1 mine emergency exercise held at Ensham Coal Mine between 9.00 am and 5.00 pm on 5 November 2013.

All Queensland underground coal mines are required to test their emergency preparedness by running simulated emergency exercises annually. This requirement was a recommendation of the Warden's inquiry into an explosion at Moura No. 2 Underground Mine on 7 August 1994 in which 11 miners died. Fifteen of these exercises have been conducted since 1998. One mine is selected to be the focal point of the state's emergency preparedness and is the host for the level 1 mine emergency exercise. This is the report on the sixteenth level 1 exercise.

The requirements for conducting mine emergency exercises are set out in Recognised Standard 8, which along with reports of recent exercises, is available on the Department of Natural Resources and Mines (DNRM) website.

Ensham Coal Mine is an underground bord and pillar coal mine located approximately 40 km north east of the regional centre of Emerald, Central Queensland and approximately 200 km west of Rockhampton (see Image 4).

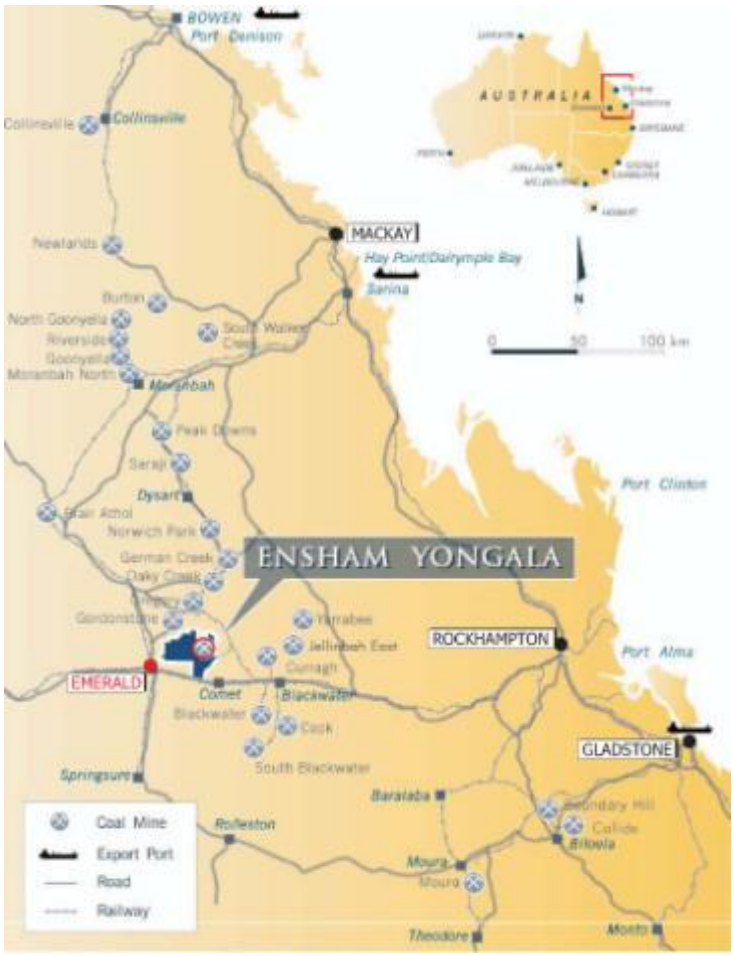


Image 4: Location of Ensham Coal Mine

Objectives

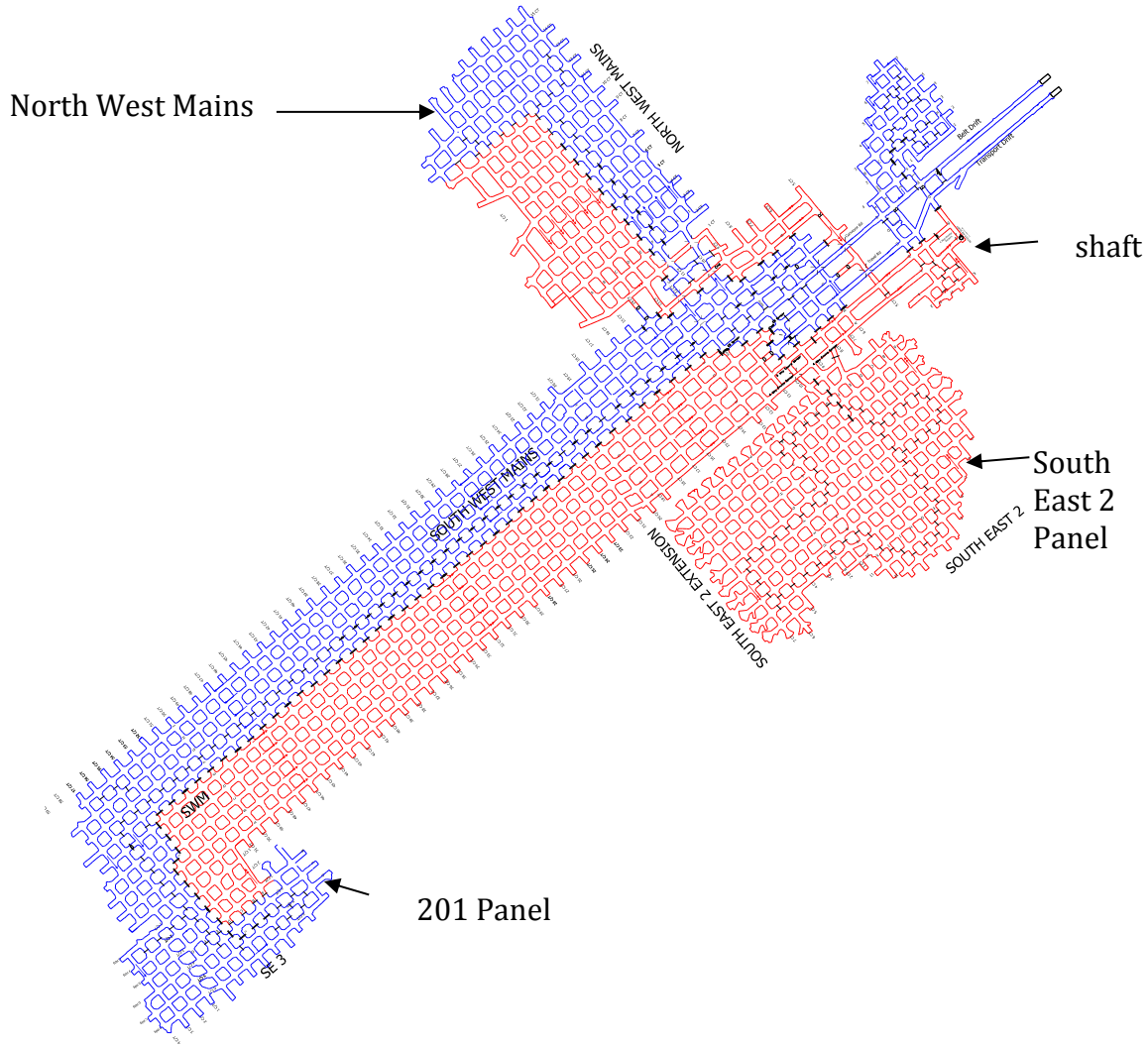
The objectives of exercise were to test:

1. self-escape capability including changeover process deployed from SCSRs to CABA
2. IMT processes
3. mine personnel interaction with outside agencies particularly police
4. QMRS response deployment and search and recovery.

Ensham Coal Mine

Ensham Coal Mine is a small bord and pillar mine which has two working sections 201 Panel and the North West Mains producing high energy low ash thermal coal (see Figure 1).

Figure 1: Plan of Ensham Coal Mine



The coal is cut using a continuous miner and loaded into shuttle cars which transport the coal to the mine conveyor belt system. The mine has negligible seam gas and typical gas analysis at the return shaft is equivalent to fresh air.

The mine has a gas monitoring system consisting of both tube bundle and real time equipment. The real time sensors installed underground and respective monitoring ranges are:

Table 1: Gases measured by the real time system

Gas	Range
Methane CH4	0-5%
Oxygen O2	0-25%
Carbon Dioxide CO2	0-5%
Carbon Monoxide CO	0-100 ppm

There are three tubes installed underground for the tube bundle system. These are placed either side of the shaft and at the return of the South East 2 Panel.

Respective monitoring ranges for gases monitored on the tube bundle are:

Table 2: Gases analysed by tube bundle system

Gas	Range
Methane CH4	0-100%
Oxygen O2	0-25%
Carbon Dioxide CO2	0-100%
Carbon Monoxide CO	0-1000 ppm
Nitrogen by difference	0-100%

The mine does not have a gas chromatograph.

Scenario

On review of the mine ventilation simulation and the requirement to test the identified objectives, the scenario developed was based on a vehicle crash in the men and materials drift and subsequent vehicle fire.

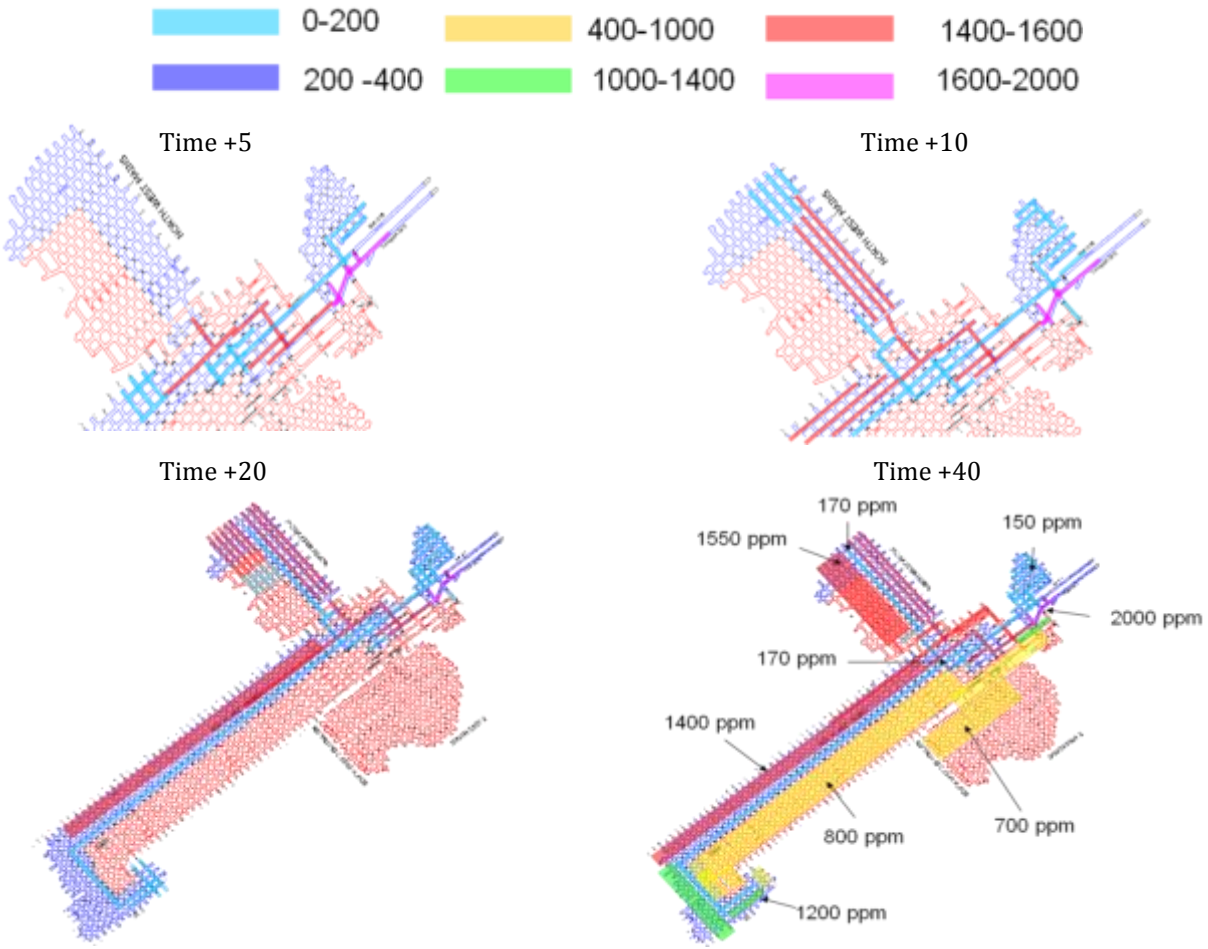
The scenario was based upon the driver of a PJB having a heart attack and crashing the vehicle. A passenger inside the vehicle is dazed as a result. The driver gets out of the vehicle and collapses outbye (up wind) of the vehicle. As the passenger goes to raise the alarm he notices that the vehicle is on fire.

For this scenario it was decided that:

- The driver would succumb to the heart attack and subsequently die as a result.
- Any reasonable fire fighting response would put the fire out, however the pollutants within the mine would always remain above 100 ppm of carbon monoxide (CO).
- During the mine evacuation one person would be lost in the South East 2 Panel
- The fire on the vehicle achieves objective no 1 self-escape
- The fact that the driver dies involves the Police and achieves objective no 3
- The lost man and the irrespirable atmosphere (+100 ppm of CO) achieves objective no 4, deployment of mines rescue and establishment of a FAB.
- Objective No 2 is achieved by the mine following its emergency response plan and forming an IMT.
- A total of 16 assessors were on site with representatives from Safety in Mines Testing and Research Station (Simtars), the Queensland Mines Inspectorate, Mines Rescue (Queensland and New South Wales), an industry safety and health representative (ISHR) from the Construction, Forestry, Mining and Energy Union, Minerals Industry Safety and Health Centre, mine staff from Oaky North, Oaky No 1 and Kestrel (see Appendix A for details of the assessors).

Details of the spread of smoke are shown in figure 2 below.

Figure 2: Smoke Spread Time+5 to Time+40



Underground assessments

Men and materials drift accident site

Assessor: Stephen Bullough

At 9.00 am the PJB driver suffered a heart attack and lost control of his PJB causing it to smash into the right hand side rib (side wall) looking inbye, directly under a high tension (voltage) cable (HT cable). The driver got out of the PJB and collapsed a few metres outbye (upwind) of the PJB in fresh air. The passenger was disorientated but dealt with the driver putting him in the recovery position. The accident caused a fuel leak and subsequent fire on the PJB. This left the passenger with two issues to deal with – a fire on the PJB and an unconscious passenger who had suffered a heart attack and had a faint pulse.

The passenger attempted to put the fire out with a fire extinguisher and was told the attempt had failed.

The PJB passenger made the decision to go to the surface and get hoses to fight the fire and notify the control room of the incident. The passenger observed an Eimco driver in the area and briefed him on the incident and asked him to go to the injured mineworker and look after him.

The passenger retrieved one inch hoses and commenced fire fighting activities. This was an **excellent first response** and would have put the fire out very quickly. At this point he was informed the fire was out but still smouldering.

The fire continued smouldering creating an irrespirable atmosphere + 400 ppm of carbon monoxide which meant mines rescue was deployed into an irrespirable atmosphere (objective no 4).

In a real event the fire would have been out and the mine atmosphere cleared within one hour.

The fire and smoke created a situation where the inbye personnel had to evacuate under CABA and test their knowledge and ability to self-escape (objective no 1).

The mine ambulance was deployed to the portal and the unconscious man was transported by stretcher to the surface and loaded into the ambulance where the defibrillator was used on him. When the patient arrived at the surface control room he was declared deceased.

A death at a mine site is investigated by the Police to determine the cause of death and the accident site was considered a crime scene (objective No. 3).

It was noted there were other underground personnel in the workshop area who could not render assistance because they did not have their cap lamps or self-rescuers with them. Additionally, at a later time in the exercise (when portal security was provided by surface personnel from the open cut) the sentry did not know how to use the DAC communication system.

What worked well?

- Passenger's initial response to the unconscious driver to check his pulse and place him into the recovery position.
- Initial attempt to extinguish the fire in the PJB engine compartment.
- Obtaining immediate help from an Eimco operator on the surface to assist.
- Getting fire hoses to the incident site to put out the fire.
- Both coal mine workers (CMWs) knowledge of cardio pulmonary resuscitation (CPR) techniques and patient care.
- Handling of unconscious person while loading onto stretcher for removal.

Areas for improvement

- Taking approximately 45 minutes to get additional assistance to the incident site despite five people being available at portal. The five people were unable to assist, as they did not have cap lamps or rescuers. None of these five people or the sentry requested or sought cap lamps or rescuers.
- CMWs did not assess if there were any issues with the HT cable immediately above the injured mine worker. It was assumed this did not occur as it was an exercise and everything was in order.

Recommendations

Ensham Coal Mine

- When placing sentries at strategic locations in an emergency, ensure they are familiar with how to use available communications equipment.
- Have cap lamps and rescuers available in the workshop, which is located at the surface near the portal area. This will ensure people working there have access to them at all times so they can assist within the mine if there is an emergency.

Industry

- If placing sentries at strategic locations in an emergency, ensure they are familiar with available communications equipment.

201 panel evacuation

Assessors: Russell Albury, Shane Wright and Mathew Curr (Video)

At 9.08 am the production crew were actively engaged preparing the panel for production. Three CMWs were preparing the bolter for operation in F heading, four CMW's were at the continuous miner in B to A heading and an electrician and an explosion risk zone controller (ERZ controller) were outbye of the face area. The electrician received a DAC (underground intercom system) call from the control room informing him of a fire on a vehicle and instructing their crew to evacuate. The crew assembled in the crib room and were met by the ERZ controller from outbye who instructed the crew to don the CABA.

> The crew were assembled in the crib room before pollutants from the fire could reach the panel, so the ERZ controller made the correct decision to put on CABA straight away.

Five of the CMWs were asked to take off their CABA, don a training self-rescuer then undertake a changeover from the rescuer to CABA.

> This highlighted an issue with difficulties of undertaking this operation on their own and they required assistance from other CMWs to complete the task.

The ERZ controller decided to drive out of the panel using the panel PJB.

Unfortunately, the vehicle would not start and the team had to evacuate on foot.

On several occasions, the ERZ controller reported there were 10 evacuating when in fact there were only nine in the team. This was not picked-up by the control room possibly due to the Northern Light Technologies (NLT) system not functioning correctly due to an incorrect data base being loaded after a power outage.

The evacuation to the surface went well however a couple of issues were noted.

- The team were wearing goggles which impeded their vision so they walked past several DACs, where they could have contacted the surface, as they travelled out of the mine.
- At the second CABA refill station at 10 c/t the team struggled with the refill control taps.
- CABA no 45 would not recharge with air and there were difficulties with the changeover to the new CABA unit.
- On arrival at the surface all names were taken but not checked against the check board by the portal security guard and the team was transported to the lamp room area.
- The debrief and control of the 201 team was haphazard and the team was allowed to muster in the area adjacent to the control room. Several members of the team had their mobile phones with them. The team was not adequately briefed on the incident nor on the progress. One of the team members was asked by the assessors to enquire as to the status of the incident so that they could be briefed.

At 11.30 am the team was advised one person was missing and one person was dead.

What worked well?

- Donning of the CABA's with limited visibility was completed well with few difficulties. Crew members helped one another.

- The decision to don CABA was made very early before the panel air became contaminated.
- The crew used the blind man sticks to good effect. The communication amongst crew members regarding obstructions and obstacles in the roadway was very good.
- The initial decision was made to utilise the PJB for evacuation transport.
- The ERZ controller maintained a check on his crew during the evacuation and communication to control was regular, concise and clear.
- The secondary escapeway road was in quite good condition to traverse on foot.

Areas for improvement

- The initial communication to the panel was received by the electrician and the site of the fire was not communicated and he did not understand the meaning of the term “M&M”.
- The donning of self-rescuers could be improved. Some crew members would not have successfully completed this task without assistance from others.
- ERZ controller had difficulty removing the training self-rescuer. The neck strap does not have a facility to break the strap for removal. The strap must be lifted over the operators head. The deputy got the rescuer neck strap and the breathing hose of the CABA tangled.
- The ERZ controller stated that he had 10 men in his crew when there were only nine. This made the confirmation of the whereabouts of CMW’s confusing.
- The ERZ controller did not verify how many were in his crew by checking the tag board.
- As only every third or fourth intersection of the escapeway was numbered, it made it difficult for the crew to confirm their exact position. The crew communicated at one point they were at 42 c/t when they were actually at 44 c/t.
- The communication to control from the first refill station was that the crew was at the refill at 55 c/t and the actual position was 50 c/t.
- There was stowage, water and a fish tank (steel tank used to collect water for pumping) on the road between 13 and 10 c/t.
- One CABA (No 45) unit failed and would not recharge with air.
- CABA changeover was performed by changing the face mask coupler when the normal method is via the quick release couplers to the tank.
- The DACs mounted on the rib in the escapeway were not visible to the escaping CMWs.
- Crews were not debriefed when they arrived on the surface.
- Once on surface crews were not separated from others already out of the mine before being debriefed.
- The crew debrief was in relation to the exercise and did not provide information they obtained during evacuation which would assist the IMT further.
- The debrief was conducted by the panel ERZ controller not a shift supervisor or someone who knew what further information was required.
- The update given to the crews by the operations controller on the status of personnel was confronting and more thought should have gone into breaking the news of a fellow worker’s death. No counselling or other services were made available and the notice given was very brief.
- Control of information to external people should be considered with many of the CMW’s having mobile phones which could be used to contact family, friends, the media or post to social networks.
- At the surface there was no process to ensure the tag-board was used in checking people in and out of the mine.
- CMWs did not buddy up and check each other’s pressures and physical condition as they ascended.

Recommendations

Ensham Coal Mine

- Investigate options for making the DAC's more visible, in the escapeway.
- Number all intersections in escapeways.
- Investigate the cause of CABA no 45 not recharging with air, inform the Mines Inspectorate of the identified cause and ensure the fault is not present in other suits at the mine.

Industry

- Continue regular training for CMW's in the donning of SCSRs and in the changeover process from SCSR to CABA.
- Standardise the process for changing from one CABA unit to another in the situation where one fails.
- Identify areas for CMWs to be located when they have evacuated from underground in an emergency.
- Improve debrief and briefings for CMWs during an emergency.

North West mains panel evacuation

Assessors: Ray Smith and Trent Griffiths

At 9.00 am the North West panel crew was flitting the continuous miner to a new cut-through. A call was received at the crib room 10 c/t H – I Heading and gas readings were shown to the ERZ controller. The gas levels were carbon monoxide (CO) 0ppm, methane (CH4) 0.0%, and oxygen (O2) 20.8%.

The ERZ controller then instructed all CMWs present in the crib room to go to the coal face and instruct all other CMWs to go to the crib room.

At 9.05 am the ERZ controller received the following readings CO 200ppm and O2 19%, he was given training rescuers and he proceeded to the face to instruct CMWs to don their SCSRs.

The changeover from SCSR to CABA was conducted with some of the team pre-flushing the face mask before donning, while others did not. Approximately 15 minutes was spent at the CABA station before leaving in a vehicle to drive out. The team was briefed by the ERZ controller on the planned evacuation route. They were to travel as far as possible in the PJB in the secondary evacuation route then complete the evacuation on foot to the conveyor drift.

> A CMW wore a real self-rescuer for 35 minutes and reported it was an improvement on rescuers he had worn on previous occasions. He also reported the efficiency had dropped away and that there was increased breathing resistance at the end of the 35 minutes.

The crew made their way to the 10 c/t CABA recharge station were difficulties were encountered recharging the CABA suits.

What worked well?

- Donning of the SCSRs was completed well with few difficulties.
- Gathering the crew and linking everyone together to travel to CABA changeover was excellent.
- Instructions/communications to crew of their intentions to evacuate.
- Sentry at the portal controlling personnel.

Areas for improvement

- Changeover from SCSR to CABA. (pre-flushing of CABA during changeover)
- Droppers and indicators for the location of CABA changeover and refill stations.
- Trafficable second means egress out of mine from North West panel.

Recommendations

Ensham Coal Mine

- Review training in the donning, wearing and changeover of SCSRs to CABA for all underground CMWs.
- Investigate if there are any issues relating to the recharge station at 10 c/t or if refresher training is required.
- Ensure second means of egress from the mine are trafficable.

Industry

- Best practice for identifying SCSR/CABA locations in poor or limited visibility.
- Best practice in changeover from SCSR to CABA (pre-flushing of CABA during changeover.

Exercise team

- Continued use of real SCSRs gives CMWs an excellent experience.
- Continue to use the mine's CABAs and sight impaired goggles, as they give a more realistic feel to the exercise.

Image 5: Queensland Mines Rescue Services response team

Surface assessments

Control room

Assessor: Sean Muller

At 9.00 am the control room was informed a vehicle had crashed in the drift and caught on fire. The driver was found to have no pulse.

The control room team delivered the communications to control the fire, get medical attention for the casualty and evacuate the workers from underground.

What worked well?

- An assistant CRO was available to help when multiple communications came in or had to be delivered quickly.
- The emergency coordinator worked out of the control room helping the communications and organisation of responses.
- The control room quickly identified that one man was missing at 9.54 am.
- Gas readings and gas alarms were identified quickly and reported. Gas trending was used well.
- Communication to underground crews for evacuation was quick and effective.
- Control room officers had an excellent understanding of where people were located and what they were doing.
- The ventilation officer made regular visits to the control room.

Areas for improvement

- More effective communication to control room from IMT in terms of plans or intentions.

Recommendations

Ensham Coal Mine

- Additional tube bundle monitoring points; many real time sensors were maxed out on the CO readings.

Industry

- Ensure control rooms have enough people to manage the range of communications in an emergency event.
- Use of underground cameras in emergency escapeways/strategic locations.
- Mine monitoring in escapeways and CABA stations.

Exercise team

- Use of audio recording equipment to capture communications in the control room.

Mines rescue response

Assessors: David Connell, Trent Griffiths and Ray Smith

Actions taken by QMRS personnel:

- ensured resources were set-up in the Ensham sub station
- checked arriving team members for BA and medical status
- organised into teams
- briefed team captains
- set-up FAB at the portal
- deployed a team of eight underground to search for the missing person.

What worked well?

- The sub station was managed effectively with gear tested and allocated ready for deployment.
- Team members followed correct QMRS procedures.
- The team deployed underground for the search followed the task sheet supplied by IMT and searched the areas indicated on the plan supplied to the captain.

Areas for improvement

- Conduct activities proficiently with deployment expedited when lives are at risk.
- Emergency response should not be delayed at the security gate for normal operations compliance checking (ie vehicle checks at the security gate) when lives are at risk.
- Parallel tasks should be considered to improve time to deployment of teams such as early establishment of an FAB.
- Arriving QMRS operations managers appeared to have problems sourcing a full and complete briefing from the IMT leader and ventilation officer, which was critical to achieving the objective of locating the missing person and should have the highest priority.
- With lives at risk, the FAB controller should focus on getting active teams away.
- A briefing given simultaneously to all team captains and members instead of the same briefing multiple times.
- The mine plan given to the active team captain was inaccurate and caused navigation problems.
- Communications must go through FAB for team safety and so the FAB can send standby teams active in a timely manner.
- The active team captain did not adhere to the communication times, FAB recognised the team had not reported back but a standby team was not sent active immediately.
- Only one team was sent active for the search when there were 16 people ready. FAB had two teams with one standby team acting for the two with different return times.
- During the briefing of the second team in the rescue room, there were mine rescue people servicing suits, talking and shouting amongst themselves, making the critical briefing difficult and ineffective.

Recommendations

Ensham Coal Mine

- Ensure plans are accurate and show stowage and all temporary stoppings.
- Ensure plans given to teams are reviewed by people familiar with the area to ensure the route of travel is achievable and progress won't be stopped by known water, stowage, falls, solid stoppings or other obstacles.

Industry

- Ensure mine procedures associated with arriving emergency services are streamlined to prevent delays.
- Have the appropriate person to give a full and accurate briefing to QMRS officers upon their arrival to expedite deployment.
- Implement MRAS to assist when QMRS arrive onsite, with information/incident questions answered.

QMRS

- Instil a sense of urgency for lives at risk situations in training.
- Ensure officers are able to recognise opportunities to increase efficiency by running parallel tasks.
- Ensure team communications always go through FAB.
- Ensure FAB training highlights the importance of sending standby teams active immediately when an active team is overdue.
- Consider briefing all team members in a single briefing to save time and ensure a common operating picture is maintained. Captains can then be given mine plan specific instructions.
- Send multiple teams active to enlarge the search box whenever possible.

Incident management

Assessors: David Cliff and Ruth Fuller

What worked well?

- In general, the structure and organisation of the IMT process was very effective.
- Overall the incident was well managed and effective control of the fire was achieved.
- Objectives were set and reviewed regularly.
- The use of a process checker (IMT coordinator) was very effective in ensuring the completion of tasks and the checking of actions against the duty cards, especially during the initiation of the incident management. In addition this role checked to make sure function leaders were clear on their actions and updated the status boards.
- The checklists provided in the duty card folders in general worked well, though there was duplication of checklists between roles and it was not clear on some occasions who was supposed to carry out some of the actions.
- There was effective use of Ventsim (computer based ventilation simulation package) to simulate the flow of pollutants into the mine, to indicate the safest escape routes and the potential for asphyxiation/poisoning by CO. The mine had an accurate Ventsim and included realistic leakage through ventilation stoppings.
- It is clear that there have been a number of rehearsals for this exercise using the duty cards and ancillary status boards – though planning did not access their status boards (these remained in the IMT for the length of the exercise).

Areas for improvement

- Despite the use of boards to set and monitor objectives there was inadequate focus on the number and location of persons underground. For example the IMT were not aware that the crew in 201 had to walk out due to the failure of the PJB in the panel to start. It was also some time before the IMT recognised that there was a missing CMW identified in the control room at 9.54 am formally noted in IMT at 11.07 am.

There was a status board (SB2) that would serve this function though it was deployed in IARG Crisis Management Team. It is noted that creation and maintenance of an SB2 in the IMT room is listed as a task of the incident management team coordinator on his duty card. There was an electronic system for monitoring the location of persons underground which proved to be not operating properly. This fault was not detected until several hours into the incident.

- The IMT system is based upon the AIIMS system, with situation reports being created though none were formally issued or used as the basis for reporting to others or updating third parties.
- No formal incident action plans were prepared in the IMT.
- Some documentation was inconsistent – for example the designated function holders identified on the duty cards are at variance with those listed in TOOL 12.00-01-04 IMT duty holders
- The HMP.12.00.01 HMP does not specify the training requirements for the incident management team to carry out their functions. It was clear that a number particularly in IARG had not reviewed their duty cards prior to the incident.
- The planning function could have considered ways to control the fire through ventilation modification earlier than was discussed at IMT.

- Ready access to relevant technical information such as the toxicity of CO is required. There was considerable discussion over what constituted a toxic atmosphere. This information was readily available either via the web or from standard text books –such as the New South Wales Mines Rescue Handbook.
- The importance of debriefing those who have exited the mine was not recognised. Little information from debriefs reached the IMT.
- Incident overview status board (SB1) does not report the current status of the incident only the initial incident. The board should be modified to monitor the current status – consistent with the situation report and should include information on the current location of persons underground. A number of key roles in the management of the incident were not listed as being filled.

Image 6: Incident overview status board at 12.00 pm

- Fatigue is recognised as an issue for extended response to an emergency yet, planning for replacement only occurred toward the end of the day. It would be better for the alternate IMT to be quarantined at the start of the incident and sent off site to rest prior to them needing to take over.
- There was no formal systematic recording of the mine atmosphere conditions or changes in the conditions in the IMT room.
- Personnel appeared to be unfamiliar with the operation of Microsoft Excel, and had difficulty in formatting cells and making text clearly visible.
- Early in the incident personnel could have been tasked with preparing information to expedite the deployment of rescue teams – e.g. access to MRAS.
- The functionality and location of monitoring points of the NLT system to should be clearly identified and key personnel should be aware of this information.
- It is probably not advisable to have sensitive information such as the status of personnel on public display – the general manager's group had a personnel status board on display in an open plan kitchen area.

Recommendations

Ensham Coal Mine

- The mine should review the effectiveness of the duty cards and other documentation such as checklists and display boards to ensure they are effective.
- The location of key functions should be reviewed for suitability and provision of facilities – e.g. the IARG General Managers group.
- There needs to be a protocol that can be invoked to ensure that the personnel tracking system is functioning properly with all nodes in operation and this should be checked off so all workers at the site can be identified. Mine should consider having a personnel tracking screen available for the IMT to view.

Industry

- There should be an investigation in the factors that caused the late deployment of the QMRS teams to occur. It would appear that there was a delay in mobilising the teams, but also once the teams arrived on site it took some hours to get them underground. This should include an adoption of the MRAS system if necessary.
- The role of control room operator should be a recognised competency with formal skills and experience requirements (this should not be taken as a criticism of the CRO operation at this exercise).
- HMPs should include definition of emergency management training requirements in more than motherhood statements.
- Consider installation of underground cameras to assist with data collection and remote monitoring of mine areas and functions including access and egress at the portal, control room computer screens, emergency escapeways and other strategic locations.
- Consider having access to mine systems such as CITEC in IMT or operations areas.

Exercise team

- Mechanisms for direct communication between key locations for assessors should be investigated – e.g. between exercise coordinator and incident site, or between the exercise coordinator and particular assessors. This would allow independent reporting of the status of the incident and progress in establishing control.
- The need for QMRS callout should be reviewed; there may need to be an alternative process invoked to prevent the scenario from becoming too artificial.

IMT subgroups and external agency (Queensland Police Service) interaction at the mine

Assessors: Bradley Watson, Steve Tonegato and Jason Hill

The Senior Leadership responded to the event quickly by establishing the IMT and initiating the mines emergency response procedures and processes. The first hour of the incident was very busy and the IMT members did well to maintain composure and adhere to the mines emergency response system. All incident management systems and processes appeared to be in place and functional within 90 minutes of the initiation of the event. All notifications to the regulators were completed within 35 minutes of the initiation of the event and a Mines Inspector was on-site and providing support within 90 minutes. Information provided to external agencies was clear and concise and there was no speculation, only known information provided.

The IMT appeared to function well and acted appropriately and in a timely manner to the information as it came to hand. It was clear that the IMT Leader was leading the IMT and the lines of accountability appeared well understood by everyone involved in managing the incident.

What worked well?

- The prompt notification of the event to external agencies and the prompt response to site by the Mines Inspectorate.
- The transfer of information in the initial stages of the incident was concise. Initial notifications involved the communication of known information only, there was no speculation.
- The IMT functioned well and responded in an appropriate manner to the known information as the event progressed.
- The interaction between the mine and the Queensland Police Service personnel was observed to work well.
- The committed and diligent use of supplied personal ‘Response folders’ and associated ‘Duty Cards’, led to an appropriate and efficient deployment of resources, which greatly assisted in ensuring that effective control of the emergency took place.
- Use of incident control system (ICS) /AIIMS emergency management gave confidence to Queensland Police that the emergency was being effectively managed. This allowed the Police to focus on their main objectives without needing to take overall responsibility for Incident Control.
- Police Officers and Inspectorate mutual understanding of roles and responsibilities led to effective cooperation.

Areas for improvement

- The Mines Inspectorate Incident Hotline was not used in the initial instance. The local Mines Inspector was called and informed of the incident.
- The numbers of personnel present in the IMT meetings could be improved. Personnel numbers fluctuated throughout the day which increased the pressure on the IMT as various external parties observed the process.
- The identity of the personnel impacted by the incident was not protected to prevent an uncontrolled release of information. The identity of the deceased person was widely known to all persons onsite, not just those actively engaged in the management of the event.

- Whilst the use of duty cards and personal folders was good, the use of pre-prepared whiteboards (e.g. SB3 Objectives Status Board and SB4 Logistics Status Board) was quite poor and did not meet the intended outcome of the use of these boards. Also, other critical components of an ICS system could be improved, namely, e.g. management by objectives (all functional groups had their own objectives on their own objective boards, tasks were not measured against objectives, and little or incomplete use of internal request and authorisation forms).
- Poor analysis and interpretation of information relating to underground personnel and their location led to confusion and delays in understanding the situation – this was partly due to some data focusing on numbers of tags, whilst some focused on names of people. It also became apparent that the location of the underground tag board at the administration office could lead to a situation where a person had their tag on the board but may indeed not be underground.
- Analysis of data to determine the survivability of any persons remaining underground did not formally take place. The first question regarding the likely condition of any persons remaining underground was raised by the Queensland Police force, and this was two hours and 35 minutes after the start of the incident.
- Queensland Police officers were handed around to various on-site personnel whilst following lines of action and data gathering. At one point the officers were left unattended and waiting for some time for someone from the mine to get back to them.
- When dealing with the deceased, information relating to his details and the announcement of his deceased status was freely disseminated, and the body was left in an unsecured first aid room.
- The identity of the deceased and missing persons was not controlled. Both the deceased and missing people's names were displayed on a resource board and clearly visible in a common area which was unsecured and frequented by persons not involved in the active management of the incident. The deceased person's name was provided to an external regulator. The deceased person was frequently referred to by their name by everyone involved in managing the incident and there were a number of miscommunications regarding his status. For example during an interaction between IMT members it was confirmed that the injured person was breathing when this was unknown.

Recommendations

Ensham Coal Mine

- Review the location of IMT break out rooms to ensure that sensitive information, such as the identity of the people involved in the incident is not accessible to those not involved in managing the incident.
- Restrict the number of people in the IMT meetings to those directly engaged in the active management of the incident and direct all other personnel to allocated emergency assembly points.
- Asses the value and likely use of any information "boards" that will be used, and deliver training in their use.
- Develop a system/procedure relating to the underground tag board, specifically dealing with assessing the identification individuals and their location.
- Reconsider the procedures regarding security/dissemination of information relating to any on site fatalities and their bodies.
- Reconsider the procedure relating to dealing with external agencies such as Queensland Police.

Industry

- Review emergency response systems to ensure that the identities of those involved in the event are controlled to allow appropriate NOK notification processes to occur.
- Review emergency response systems to ensure that emergency hotlines such as the Mines Inspectorate Hotline are used in an emergency.
- Ensure that protocols managing interactions with external agencies such as the Queensland Police Service are in place for emergency response. Initiate interaction with external agencies to gain mutual understanding of process and accountabilities outside of an emergency event.
- Consultation with Inspectorate and Queensland Police regarding emergency powers of each entity and communicate with Industry.

Exercise team

- Provide resources to allow role playing of NOK to test appropriate notification processes in place at mines.
- Review scenarios as part of the debriefing process to ensure a viable and realistic response for the whole exercise, noting some confusion occurred when the smoke hazard simulation continued to affect mine workings after the fire was effectively and quickly extinguished. This occurred as it was deemed necessary to maintain an irrespirable atmosphere within the mine in order to test QMRS deployment.

Site security

Assessors: Robyn Lihou

At 9.20 am the front gate staff was informed of emergency situation in the mine and were to expect two ambulances and there was an unconscious person on site. The following flowed smoothly with the notification of Mining Operation in Shutdown / Water Cart called for / Road Trail Circuit in Shutdown.

This was followed by a total shutdown of the mine and all incoming and outgoing traffic.

What worked well?

- Radio and phone communications with front gate were constant and informative.
- Staff managed gate together well, even under pressure.
- Staff knew procedures and followed instructions. When directions were not clear, they asked for clarification.
- Staff handled all communication with incoming and outgoing traffic in a precise and firm manner. Even when the oncoming night shift wanted to be allowed in before all clear was given for them to continue to compound.

Areas for improvement

- Staff not to think of the exercise as a personal observation of their work but an overall mine exercise/observation. They should go about their work and not think they are under individual scrutiny.

Recommendations

Ensham Coal Mine

- Boom gates to have a manual over ride system in place for each gate, incoming and outgoing to aid in lockdown period.
- Large sign to advise of a lockdown situation for traffic to see and reduce calls to security.

Industry

- Continued support of staff in all areas and check points.
- Keep all lines of communication open and keep it simple and precise.

Media and crisis communication procedures

Assessors: Jamie Collins, Jo Clark, Elliot Franks and Carl Glen

The assessors worked with the DNRM Incident Response Management team to simulate media interest in the event. This included advice to ensure media/crisis communication protocols were observed appropriately during the exercise.

Shortly after the initial incident notification was received, example follow-up questions were developed to simulate the preparation of a Queensland Government media brief in consultation with the Chief Inspector.

At 11.00 am a person identifying themself as a media reporter for the exercise contacted Ensham Coal Mine requesting information about reports of an emergency/fatality.

The call was answered by an administrative person who informed the 'reporter' they were not an authorised spokesperson, but they would take details and get someone to call them back.

At 11.05 am a person identifying themself as a media reporter for the exercise then called the company's nominated media liaison officer asking for details of the incident. They responded stating a media statement would be made available within half an hour and no casualties had been confirmed at that time. The site was being evacuated, emergency services were on the way, and the company was cooperating with relevant authorities.

At 12.00 pm an initial 'this is an exercise' media release was provided by Ensham Resources. This statement was not provided on company letterhead.

At 1.20 pm a second 'this is an exercise' media release was provided by Ensham Resources confirming some of the facts requested earlier including the fatality and missing mine worker. The next 'this is an exercise' media statement was more detailed and was provided by the company on its letterhead.

At 4.20 pm the missing mine worker was found by rescue teams and the exercise was completed. A final media statement on the conclusion of the exercise was not provided.

A 'dummy' social media report was provided to mine management during the event, however there was no response made. Given many of the CMWs had their mobile phones in the muster area, dealing with social media would be an issue.

The Ensham exercise did not generate any 'real-life' media enquiries so it was not necessary for DNRM media manager or Queensland Police Media to coordinate the provision of information about the exercise for journalists on the day, however holding lines were prepared to manage this eventuality.

What worked well?

- No information was released by Ensham Coal Mine other than through their media liaison officer.
- Factual media responses and updates were provided during the exercise at key intervals.
- Established media protocols for mine emergencies and serious incidents were observed that will aid future training and review.

Areas for improvement

- The first media response was timely but was not issued as a formal Ensham Resources document, limiting the opportunity to manage higher volumes of media calls and press enquiry deadlines.
- A final media statement confirming the facts on what had occurred and the outcome of the search for the missing mine worker could have been made before close of business to limit inaccurate reportage.
- Responses provided to social media reports and plans in place for social media in an emergency.

Recommendations

Ensham Coal Mine

- All press statements be provided on letterhead by the company's nominated media manager.

Industry

- Recognised Standard 08 Conduct of Mine Emergency Exercises identifies the need for possible press/media involvement therefore all mines and mining companies should prepare adequate documentation/information resources to issue to the press at a time of crisis.
- SSE's and mining companies should review their capacity to respond to social media during an emergency, particularly in situations involving serious injury or fatalities.

Exercise team

- Review the opportunity for further press/media involvement during mine emergency exercises and training to ensure that timely and accurate information is made available to their corporate headquarters. Social media should also be considered.
- Consider the provision of photographs and video footage to aid media briefings and future training.

Image 7: IMT debrief after the exercise

Conclusions

The mine response to the exercise was conducted in a very professional manner. The major conclusions made as a result of the assessors observations are as follows:

- The first response to the vehicle crash and fire was excellent proving that in a real event the fire would have been extinguished and the smoke quickly cleared from the mine.
- The mine staff involved at the accident site had very good knowledge of fire fighting procedures and resuscitation
- Mine staff had practiced their incident management system and followed the process very well.
- There was a delay in mobilising QMRS to site.
- QMRS took a long time to attend site and deploy underground.
- The mines inspector and police representative coordinated their interactions with IMT including the accident investigation.
- The mine evacuation was completed in a timely manner with a couple of issues noted on donning SCSRs and the changeover process from SCSR to CABA.
- Some confusion was observed when the smoke hazard simulation continued to affect mine workings after the fire was successfully extinguished. While the IMT identified several options to address the smoke hazard, it was deemed necessary to maintain an irrespirable atmosphere within the mine in order to test QMRS deployment. As part of the debriefing process, it was agreed scenarios be reviewed to ensure a viable and realistic response for the whole exercise.
- It took some time to identify that there was a missing person. This was not helped by the NLT system not functioning correctly due to an incorrect data base being loaded.
- There was no established security around the deceased.
- There was a lack of urgency displayed by QMRS and sometimes within the IMT. This could have been due to the fact that the ‘fire’ was out.

Appendix A: Assessors

Russell Albury (Underground Assessor 201 Panel)

Deputy Chief Inspector of Mines

Russell has over 30 years of mining experience largely associated with underground coal.

He is a qualified and experienced underground mine manager and has worked in both New South Wales and Queensland as a mine manager.

Steve Bullough (Underground Assessor Incident Site)

Rio Tinto Coal Australia Superintendent Compliance

Steven is currently working with Kestrel mine. He has an extensive mining background, having worked underground for over 30 years in varying roles from miner through to shift coordinator at coal mines throughout Queensland and New South Wales. Steve was a former board member for the QMRS and was an assessor for the Blackwater district mines rescue competitions until 2005. Steve has been involved in mines rescue activities since the 1982.

David Cliff (Organising Committee and IMT Observer)

Acting Director, Minerals Industry Safety and Health Centre (MISHC) University of Queensland

David Cliff was appointed Professor of Occupational Health and Safety in Mining and Director of MISHC in 2011. His primary role is providing education, applied research and consulting in health and safety in the mining and minerals processing industry. He has been at MISHC over twelve years.

Previously David was the Safety and Health Adviser to the Queensland Mining Council, and prior to that Manager of Mining Research at the Safety in Mines Testing and Research Station. In these capacities he has provided expert assistance in the areas of health and safety to the mining industry for over twenty three years. He has particular expertise in emergency preparedness, gas analysis, spontaneous combustion, fires and explosions, including providing expert testimony to the Moura No, 2 Warden's inquiry and the Pike River Royal Commission. In recent times he has also devoted a lot of energy to fitness for duty issues particularly fatigue management. He has been a member of the organising committee for the level one emergency exercises in Queensland underground coal mines since their inception in 1998. He has also attended or provided assistance in over 30 incidents at mines.

David has also extensive experience in providing training and education in OHS in mining to in many countries.

He has published widely in the area of occupational health and safety in mining including not just the physical hazards but also on the processes for the effective management of these issues. Examples of this include reviews of the annual safety performance report for the Queensland Department of Natural Resources and Mines and assistance to the Mine Safety

Advisory Council of NSW in developing Health Management Plans (HMP) and key performance indicators for HMP.

David Connell

Regional Manager – Hunter Valley, New South Wales Mines Rescue

David is currently the Manager of Hunter Valley Mines Rescue Station. He has 26 years experience in the coal mining industry and 17 years in mines rescue. He has been involved in several mining emergencies including Pike River, Beaconsfield and the Blakefield South incident and recovery. He has also been involved in planning, running and assessing a number of simulated emergencies in both New South Wales and Queensland.

Matt Curr

Video DNRM

Matt is Senior AV Designer for DNRM and produces videos and animated infographics for Queensland Government. He prefers more light to shoot in and environments where electronic equipment doesn't make the air ignite. This is his first level 1 mine emergency exercise.

Christian Ecker Underground Assessor

Production Co-ordinator at Ensham Resources

Having originally commenced his underground coal mining career 18 years ago as a clean skin underground miner at the South Blackwater Kenmare Mine, he has since enjoyed various roles in the industry such as Deputy, Mining Co-ordinator and Shift Supervisor.

Christian gained his Third Class Ticket in 2006 and is presently studying for his Second Class Ticket.

Ruth Fuller

Full-time PhD candidate at the Minerals Industry Safety and Health Centre (SMI –MISHC) at the University of Queensland

Ruth is investigating non-technical issues that may improve decision making in IMTs during coal mine emergencies. This is Ruth’s third level 1 mine emergency exercise and the third year of her PhD. Ruth is a chartered professional civil engineer with Engineers Australia. She is now pursuing her interest in psychology and its application to the mining industry. Ruth has honours degrees in civil engineering (1996) and psychology (2005), and a graduate diploma in teaching (2008).

Trent Griffiths

Production Manager at Oaky Creek Coal – Oaky North Mine (Glencore)

Trent stared his career in the underground coal mining industry as a Mining Engineering Graduate in 2004. During this time he has performed a number of roles and gained experience as a gas drainage co-ordinator, Ventilation Officer, Senior Mining Engineer, Technical Services Manager, Development Superintendent and now currently as a Production Manager. Trent has been an active QMRS member since 2006 and was part of the first mines rescue team deployed in the 2007 level 1 mine emergency exercise at Grasstree Mine. Trent participated in the 2004 level 1 mine emergency exercise whilst working at Oaky No.1 mine. This is Trent's first level 1 mine emergency exercise as an assessor as part of the 2013 organising committee.

Jason Hill

Industry Safety and Health Representative (ISHR)

Jason is and Industry Safety and Health Representative (ISHR) based in Emerald. Jason is employed by the Construction, Forestry, Mining and Energy Union (CFMEU). Jason has considerable experience in underground coal mining and is responsible for mine inspections, audits and safety investigations

Robyn Lihou

Administration Simtars

Robyn has been with Simtars for 3.5 years as an Administration Officer in the Mining Research and Development Centre as well as the Engineering Testing and Certification Centre. In addition to administration duties In the Mining Research and Development Centre Robyn also assists with research projects and just recently the testing and compilation of a report and paper on guidance Lasers for Use in Dust and Smoke (part of the mines rescue vehicle project). She also assists in Simtars Library which is in the process of implementing a new Cataloguing Program for easier access to resources including research articles.

Sean Muller

Analytical Chemist Simtars

- Extensive use of gas monitoring techniques in underground coal mines, specialising in gas chromatography.
- Involved in the response to the Pike River Emergency in 2010 and gas monitoring for
- Carborough downs in 2012.
- Part of Simtars on-call emergency response team.

- Participated in previous level 1 and level 2 exercises as part of Simtars emergency response.
- Installation and training for gas monitoring systems in Australia and Internationally.
- Role in the exercise involves the generation of simulated gas data.

Raymond Smith QMRS

Operations Manager – Operations, MRAS, Gas Ticket Certification and Competitions

From team member, to team captain, to district assessor and now chief assessor, Ray's involvement with and passion for mines rescue quickly saw him acknowledged for his enthusiasm, commitment and competence. Ray participated in the 2004 level 1 mine emergency exercise evacuating out of the longwall at Oaky No.1 mine, next he was part of the teams deployed in the 2007 level 1 mine emergency exercise at Grasstree Mine. Ray has been involved as the 1st Operations Manager to site at Aquila 2011 and Oaky North 2012. This is Ray's first level 1 mine emergency exercise as part of the 2013 organising committee.

With over 15 years in the coal industry, beginning at Newlands Coal in 1998 and continuing with Oaky Creek Coal from 2002-2011, his roles and duties have included ERZ Controller, Fire Officer, Shot-firer, S.S.H.R. and Mines Rescue Coordinator.

Ray's competencies include deputy qualifications Class 3 Ticket, Certificate 5 RII50912 in Underground Mining, Certificate 5 in Business BSB5020 and Management BSB51107, training and assessment, and occupational first aid. Ray is currently in preparation to sit for his Second Class Ticket. Ray brings youth, vision, and an enthusiastic approach to strengthen and deliver the principles, purposes and pride that QMRS stands for.

Steve Tonegato

State Operations Manager, New South Wales Mines Rescue

Steve has over 27 years of mining experience in the Mining Industry, with over 25 years of those in Mines Rescue. He is a qualified and experienced mining engineer with 10 years operational experience, including statutory positions.

He began is mines rescue career as a volunteer followed by a permanent role, leading to his current State Manager position. He has also been involved in planning, running and assessing a number of simulated emergencies in both NSW and Queensland.

Martin Watkinson (Chair of the Organising Committee)

Executive Mining Engineer, Simtars, Queensland Department of Natural Resources and Mines

Martin is the Executive Mining Engineer based at Simtars responsible for leading the Mine Safety Technology Group who provide gas monitoring and emergency response support to mines in Queensland. He has been involved in all the level 1 mine emergency exercises between 2001 and 2008 and was the Chair of the committees for the 2006 & 2007 exercises. Between 2007 and 2013 Martin worked for Vale and Adani in senior management roles. He has provided emergency response advice and coordinated emergency exercises in Queensland, New South Wales and New Zealand.

Martin formed part of the Simtars emergency response to the Pike River explosions in New Zealand in December 2010 and January 2011 providing technical advice to IMT on gas monitoring and interpretation.

Bradley Watson Underground Assessor

Manager Underground Production, Kestrel South Mine, Rio Tinto Coal Australia

Brad is the Manager of Underground Production and appointed Underground Mine Manager at Rio Tinto's Kestrel South Mine. He has worked in the underground coal industry in Queensland for 14 years after starting his career as an underground mineworker and has worked at a number of operations in the Southern and Northern Bowen Basin. Brad has filled production and statutory roles including Deputy and Undermanager and has worked as an Underground Mine Manager since 2011.

Shane Wright

Senior Site Executive, Oaky No.1 Colliery

Shane is currently the Senior Site Executive of Oaky No.1 Colliery. He is a mining engineer who has worked in the industry for the last 13 years to recently obtain an Underground Mine Manager statutory qualification in 2013. He has worked in various other roles during his career, Ventilation Officer, Technical Services Manager, Development Superintendent and Production Manager. This is the third level 1 mine emergency exercise he has been involved in, one as a participant and the others as an assessor.

Glossary

Term	Definition
Approved standard	A standard made for safety and health under the repealed Coal Mining Safety and Health Act 1925 stating ways to achieve an acceptable level of risk to persons arising out of coal mining operations.
AusAID	Australian Government's overseas aid program
Bord and Pillar	Another name for room and pillar where roadways are driven to a pattern and pillars of coal are left to support the roof
CABA	Compressed air breathing apparatus
CPR	cardio pulmonary resuscitation
CH4	Methane
CITECT	Brand name of SCADA system
CO	Carbon monoxide
CO_2	Carbon dioxide
Continuous miner	Coal cutting machine used to develop new roadways in a mine.
CMW	coal mine workers
Crib room	Location where mineworkers eat and a meeting station for the ERZ controllers.
CRO	Control room operator
Cut-through (c/t)	A passage cut through the coal, connecting two parallel entries
DAC	Underground intercom system also referred to as the tannoy
DNRM	Department of Natural Resources and Mines
Eimco	Brand name of a flameproof mechanical shovel
ERP	Emergency response plan (interchangeable with EMP)
ERZ	Explosion risk zone
ERZ controller	Mine worker responsible for safety inspections traditionally referred to as a Deputy.
Face	The exposed surface of a coal deposit in the working place where mining is proceeding.

Term	Definition
Fresh air base (FAB)	A continuously monitored station for dispatch or return of rescue teams in close proximity to irrespirable zones.
Gas chromatograph.	A laboratory instrument used to analyse the composition of gas samples.
“Go line	An assembly area on the surface where mobile plant is left after servicing and when available for use.
HMP	Emergency Management Hazard Management Plans
HT cable	High tension (voltage) cable
ICS	Incident control system
IMT	Incident management team (term is interchangeable with ICT)
Inbye	Mining term for into the underground mine (away from the surface) from the point of reference
Industry safety and health representative (ISHR)	A person who is appointed under section 109(1)5 of the Coal Mining Safety and Health Act 1999 to represent coal mine workers on safety and health matters and who performs the functions and exercises the powers of an industry safety and health representative mentioned in part 8, division 2.
Level 1 mine emergency exercise	State level mine emergency exercise to test the mine’s emergency response system; test the ability of external services to administer assistance and provide a focal point for emergency preparedness in the state.
Longwall face	A method of mining flat-bedded deposits, in which the working face is advanced over a considerable width at one time.
Mines Inspector	Official employed to make examinations of and to report upon mines and surface plants for compliance with mining laws, rules and regulations, safety methods
Mines Inspectorate	The organisation who control the mines inspectors
MSHA	Mine Safety Health Administration, United States of America - Department of Labour
Mole	Name used to refer to the mine site representative on the organising committee for the level 1 mine emergency exercise.
NLT	Northern Light Technologies
NOK	Next of kin
Non-verbal	Method of communicating using beeps on a telephone or DAC

Term	Definition
communication	similar to Morse code.
O2	Oxygen
Outbye	Mining term for out of the underground mine (towards the surface) from the point of reference.
Panel	The working of coal seams in separate panels or districts; e.g., single unit panel. A longwall face is sometimes referred to a panel.
Personal emergency device (PED)	Ultra low frequency through-the-earth communication system used for paging. Originally developed to provide a fast and reliable method of informing underground miners of emergency situations. Due system enhancements and the ability to readily contact personnel wherever they are underground, PED is also sometimes referred to as Productivity Enhancement Device.
PJB	Flameproof diesel powered man-riding vehicle carrying up to 12 personnel
Portal	The surface entrance to an underground mine
Ppm	parts per million
QMRS	Queensland Mines Rescue Service
Recognised standard	A standard made for safety and health under the Coal Mining Safety and Health Act 1999 stating ways to achieve an acceptable level of risk to persons arising out of coal mining operations.
Rib	The solid coal on the side of a gallery or longwall face; a pillar or barrier of coal left for support.
Safegas	Brand name of a mine gas monitoring system (developed by Simtars).
Self containedSelf-contained self-rescuer (SCSR)	A respiratory device used by miners for the purpose of escape during mine fires and explosions; it provides the wearer a closed-circuit supply of oxygen for periods of time usually less than 1 hour.
Simtars	Safety in Mines Testing and Research Station
Stopping	A ventilation control device which stops ventilation flow
Stowage	In longwall mining the space from which the coal has been extracted and which has been filled with waste. Sometimes containing coal and other waste material.
Tag board	Peg board where underground personnel place a token to indicate their presence in a section of the mine.

Term	Definition
Undermanager	Mineworker who is in charge of the mine on a shift basis, i.e. shift supervisor.
Ventsim	Ventilation modelling software

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