



# Group 2 First Response

**FOCUS**

**Fight or Flight**

# Scope

To review world wide practice and equipment in emergency response, including:

- Identifying interface options between first response and mines rescue support, and
- The introduction of pre developed risk assessments for common mine emergencies



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# Definition of First Response

First response is the initial actions taken by the personnel on hand using the equipment available to control or contain an unwanted event that is causing, or has the potential to cause a condition of danger. It cannot be defined to a period of time, nor can an entry level be pre-determined (small fire / large fire). First response can be enacted at any level providing personnel are confident to:

- Assess the situation,
- Recognise and treat hazards,
- Use fit for purpose equipment that is on hand,
- Identify their limitations,
- Plan and communicate remedial action,
- Conduct remedial action
- Recognise evolving risk and the need to withdraw.



# Why do we need First Response?

- Previous Level 1's indicate failure to get adequate response to the incident site with in the first 5 hours
- Old systems used W65 rescuers (filter type)
- Current SCSR (O2 type) but still shown that 20% mineworkers would not successfully escape
- Still rely on escape to a place of safety
- Despite 10 years of Level 1 Exercises and the recent USA (2006) experiences - with the exception of small fires FLIGHT not FIGHT is still the accepted practice
- Place of safety is generally the surface and a risk assessment (which take considerable time to get accurate information) are conducted prior to re-entry



# What can First Response Deliver?

- Better, more timely response to most incidents
- Hence increased potential for assistance to those in by the incident site
- Quicker more accurate information flow related to the incident and conditions to aid rescue if required





# Areas of First Response

- Aided Escape
- In seam Rescue
- Fire
- Medical Assistance (include in IR atmosphere)
- Ventilation failure
- Strata control failure



# Critical Issues to Address

- Competence of underground responders
- Equipment requirements
- FRAPs – First Response Action Plans
- Personnel tracking
- Communications
- Decision making
- Protocols for initiation and withdrawal from variable scenarios





# Critical Issues to Address



## Competence of underground responders

- Potential to have multiple levels of response/training in each area
- Regular training and assessment required to identify deficiencies
- All mineworkers to have basic level of self escape, fire fighting and first aid competency
- Need for advanced levels across each area by some mineworkers to meet mines risk profile

# Critical Issues to Address

## FRAPs – First Response Action Plans

- Mines to have identified major hazards and risk to persons
- High risk areas to have controls at higher level of hierarchy of controls, (e.g. conveyor drive heads) and increased safety equipment available
- Risk based first response action plans developed for high risk hazards e.g. main conveyor fire, panel conveyor fire
- This would assist in by actioning of FRAPs or quick review to ensure changing hazards are addressed and controls implemented in a timely manner



# Critical Issues to Address

## Personnel tracking

- Current system of evacuating to a place of safety (surface) make accounting for all personnel easy.
- Introduction of first response will need to address mine workers moving from 1 panel to another during an incident.
- Currently some tracking devices for machines and persons underground although most systems are not IS.



First Response

# Critical Issues to Address

## Communications

- Redundancy required to stay underground ?
- Underground communications being developed (IS)
- Problem with using current equipment e.g. current industry equipment – QFRS
- Need to look at USA systems being researched & Standards

## Decision making

- Who makes the decision to respond?
- Current the IMT wait for information
- Need for leadership underground ?
- What is dangerous – S273 to determine withdrawal ?



# Coal Mining Safety and Health Act 1999

## Section 273

- (1) If a coal mine is dangerous, all persons exposed to the danger must withdraw to a place of safety.
- (2) If a coal mine worker is competent and able to eliminate the danger from a hazard, the worker must take the action necessary to eliminate the danger.



# Tragedies vs. Disasters

All too often we have people leaving a place of safety to help a person in difficulty and the rescuers becoming victims.



# Critical Issues to Address

## Protocols for initiation and withdrawal from variable scenarios

- Different scenarios need to be considered e.g. I/R, visibility v's limited visibility
- Can we use a SCSR for response?
- What information do we required before 1<sup>st</sup> response is allowed?
- Do all responses require gas detection equipment?
- Does the leader have to be QMRS or a Deputy?
- Current NSW MRS have guidelines for first response: explosibility; temperature; back-up teams; distance of travel and number of persons



First Response

# Costs if Not Implemented

- Risk of fatalities similar to USA 2006
- Potential for extended loss of production or the mine, if major incident is not responded to as soon as possible
- Currently all mines spend huge \$ on training and retraining new mineworkers from other mines and a large number of persons in QMRS
- Very little training currently being done for persons from other mines for mutual assistance



# Industry Common Systems

## Training Units of competency:

- MNCU1037A Escape from hazardous situation unaided (review)
- MNCU1038A Provide aided rescue to endangered personnel (review)
- MNCU1039A Respond to in-seam incident (restructure unit break into components)
  
- Fire fighting
- First aid including for unconscious patient in irrespirable atmosphere
- Use of breathing apparatus
- Gas monitoring
- Decision making / communications
- and assessment of complete unit through summative e.g. Level 1 or 2 scenario

# Industry Common Systems

- Suggest common industry training resources to ensure for use by all underground mine operators
- Develop generic training packages
- Develop generic theory and practical assessments
- Mines could deliver these on site or provide to RTO's for on-site assessment
- ADVANTAGES – transportability
  - cost reduction across industry
  - mutual assistance easier





# Fire Fighting First Response

	Level 1	Level 2	Level 3
<b>Description</b>	Small fire, electrical component fire or smoldering material, in confined area not spreading.	Open fire, frictional ignition, gas or combustible material, contained to small area, normal ventilation.	Large open fire potential to spread quickly, dense black smoke , possibility of smoke and noxious gasses backing up against ventilation.
<b>People</b>	One to Two people Confident - competent Investigate, quantify, execute, communicate.	Two or more Confident - competent Investigate, quantify, execute, communicate.	Fire Team Confident - competent Investigate, quantify, execute, communicate.
<b>People Training</b>	Regular periodic training in the use of limited fire fighting equipment, for a level one response, fire recognition and evaluation. Respond to local emergencies.	Regular periodic training in the use of limited fire fighting equipment, for a level two response, fire recognition and evaluation. Respond to local emergencies.	Regular periodic training in the use of advanced fire fighting equipment, for a level three response, fire recognition and evaluation. Self contained breathing apparatus, turbex, foam etc. G5
<b>Equipment LOCATION</b>	Fire extinguisher, dry powder, CO2, Stone dust, one inch fire hose Equipment located in line with the mines safety and health management system and subject to mine lay out and specific equipment.	Fire extinguisher, dry powder, CO2, Stone dust, one inch fire hose, fire hose(65mm) branch, fog, divider, foam low and high expansion, Equipment located in line with the mines safety and health management system and subject to mine lay out and specific equipment. Recognition of areas of heightened risk and control measures to mitigate risk.	Fire extinguisher, dry powder, CO2, Stone dust, fire hose(65mm) branch, fog, divider, foam low and high expansion, turbex, breathing apparatus, provisions for changing equipment. Change over stations or structure available near IRA where changing breathing apparatus or recharging breathing apparatus can be achieved Equipment located in line with the mines safety and health management system and subject to mine lay out and specific equipment. Recognition of areas of heightened risk and control measures to mitigate risk.
<b>Equipment Location Suggestions</b>	Fire Fighting trailers - fire fighting zones – traditional approach. Alternative - identify IRA's (increased risk areas) have equipment available suitable to control hazards in areas such as drive heads, pony drives, Mg Drives		
<b>System</b>	Fire recognition Identification of correct fire fighting equipment Confidence level in operation of equipment and processes Recognition of potential to escalate Understanding of escalation process	Fire recognition Identification of correct fire fighting equipment Confidence level in operation of equipment and processes Recognition of potential to escalate Understanding of escalation process	Fire recognition Identification of correct fire fighting equipment Confidence level in operation of equipment and processes Recognition of potential to escalate Understanding of escalation process
<b>Environment</b>	Surface buildings, workshops, underground fuel bays, electrical switching rooms (surface and below ground) Underground traveling roads, panels or belt roads.	Workshops, underground fuel bays, electrical switching rooms (below ground) Underground-traveling roads, panels or belt roads. Hot, humid, dust. Smoke	Workshops, underground fuel bays, electrical switching rooms (below ground) Underground-traveling roads, panels or belt roads. Hot, humid, dust. Smoke

First Response

# Legislative Issues

- Develop minimum standard in Recognised Standard
- Do we need to legislate main issues. Note poor response to date in SCSR training after Miner Act (USA)
- Once effective first response systems developed – can we change rescue legislation?

# Closing Remarks

- Queensland coal mines lead the way in Safety and Health Management Systems, but if these fail first response is critical to minimise fatalities.
- Industry is expanding a workforce common response training – this will save \$.
- Imperative that FIGHT not FLIGHT implemented NOW!!

The Coal Mining Safety and Health Act requires the achievement of an acceptable level of risk and to meet this all mines have SHMS and PHMP's to ensure risk is as low as reasonably achievable.

But if these systems fail and mineworkers are put in a situation where they have to escape from the mine past an out of control hazard –

**IS IT AN ACCEPTABLE LEVEL OF RISK TO NOT PROVIDE EVERY ASSISTANCE POSSIBLE TO THEM?**

## Closing Remarks



DO WE HAVE YOUR COMMITMENT AND THAT OF YOUR COMPANY TO MAKE A "STEPCHANGE" IN THIS AREA