

# **‘Third generation’ VR Training for the Mining Industry**

***“Training for Tomorrow”***

Presenter: ***Bruce Dowsett***  
Manager VR Technologies  
Coal Services Pty Limited



# Coal Services Pty Ltd

## - Business Structure -

### Vision:

...to be the trusted provider of services that protect worker safety & health and worker's compensation insurance

### Mission:

...to maintain leadership & best practice in training to improve the coal industry safety standards

## CSPL

(Parent Company)  
COAL INDUSTRY ACT 2001

### *shareholders:*

CFMEU

NSW Minerals  
Council

### Board:

Ron Land  
Wayne McAndrew  
Tony Haraldson  
Kieren Turner  
James Mackrill  
Ross Taylor  
Mark Coyne

### Mandate:

...to provide workers with Quality Training in Mines Rescue and in Health & Safety

Coal Mines  
Insurance

Coal Services  
Health

Mines Rescue  
Service

Regulation &  
Compliance

Virtual Reality  
Training



# CSPL Services

## - Worldwide Service Provision -





# NSW Mines Rescue Station Locations

## - Training Centres of Excellence -



**SINGLETON**



**LITHGOW**



**NEWCASTLE**



**WOLLONGONG**

# VR as a Training Tool

## - Industry “Step Changes” –

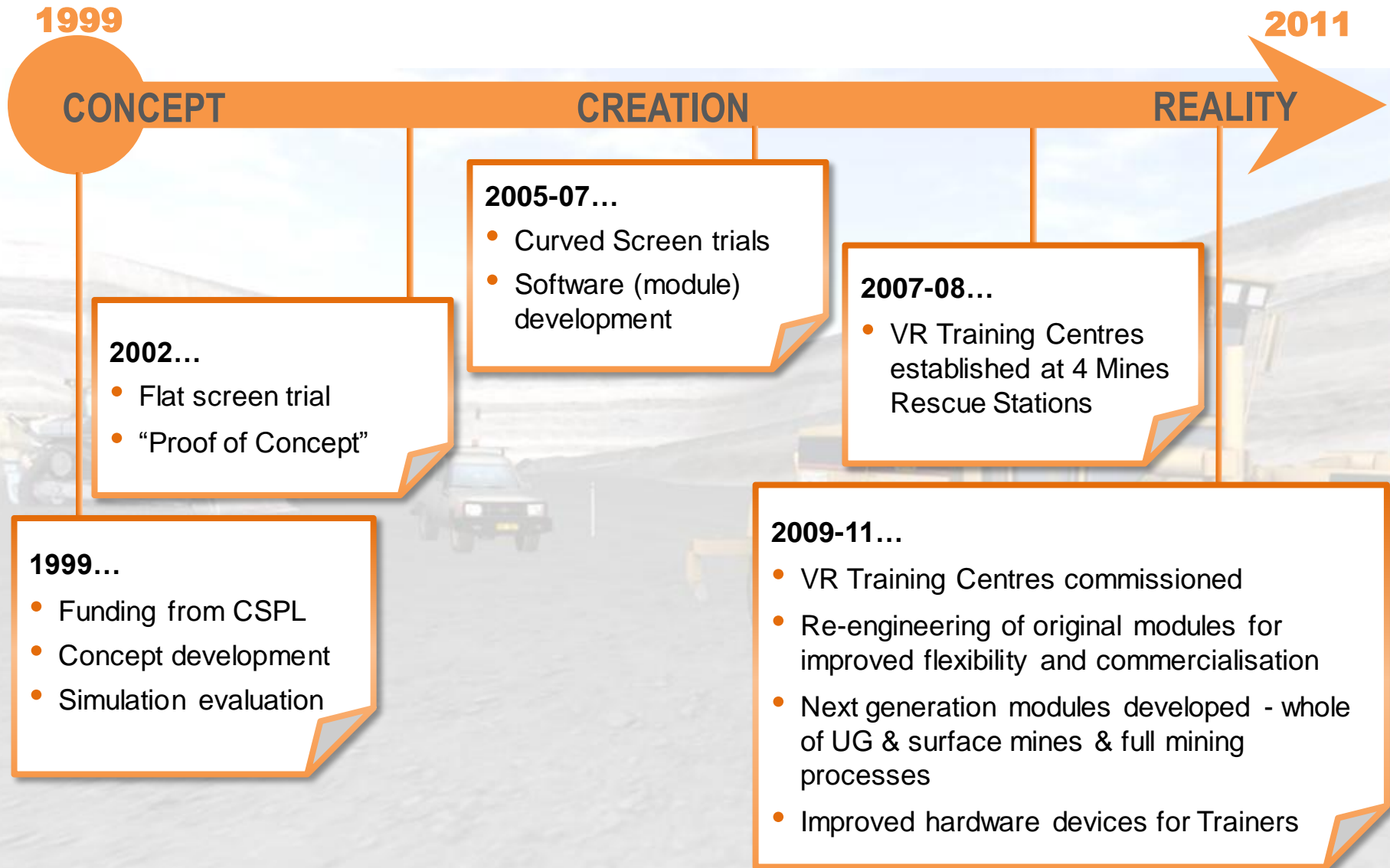
TECHNOLOGY INDUSTRY	MINING INDUSTRY	TRAINING INDUSTRY
Gaming	Computer Based Training	Blended Learning Solutions
3D	Skills Shortages	National Training Packages
Computer Power	Safety Standards	
Portability	Industry Consultation	

*Saving lives by putting people at risk...*



# VR Concept Development

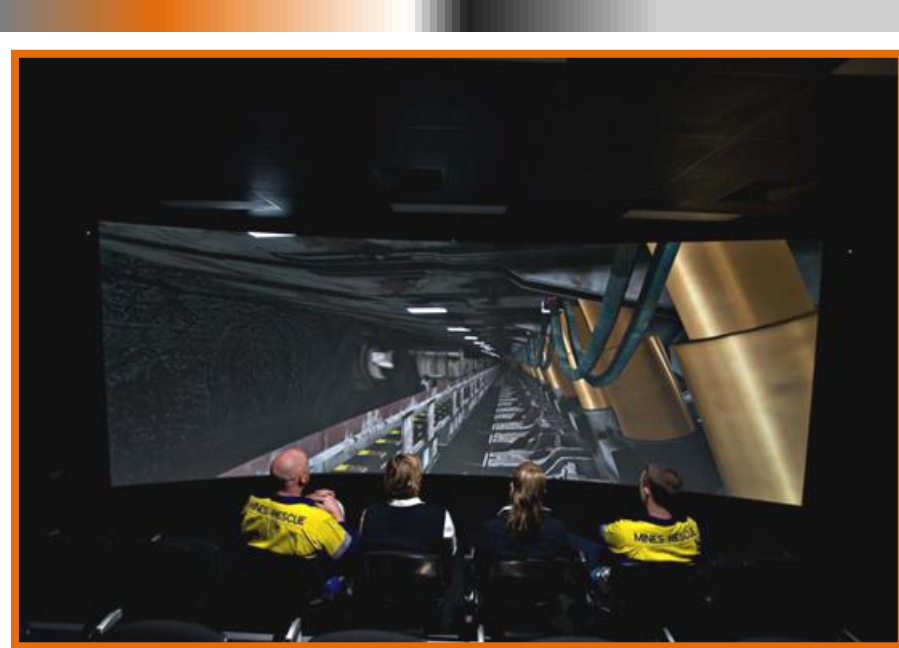
## - A Decade of Progress -





# VR Hardware & Facilities

## - VR Platforms -



The Curved Screen, the 360 Degree Theatre and the Domes.

Three Platforms across all sites

# Mines Rescue Activities

## CORE ACTIVITIES

Provide emergency response capability to collieries

Provide & maintain equipment for emergency response

Provide training to brigadesmen

## OTHER ACTIVITIES

Provide gas analysis & interpretation to collieries

Provide expert advice regarding emergency preparedness to collieries



## COMMERCIAL ACTIVITIES

Generic Coal Inductions

Safety Refresher Training

Statutory Mining Supervisor Training

Emergency Preparedness

Customised Company Training

Workplace Trainer & Assessor Training



# VR and Industry Training

## - Participation -



### Training:

- mines rescue brigades
- industry refresher training
- contractors inductions
- mine specific training
- mine supervisor training
- fire teams
- mines rescue comps
- Associated industries & delegations

### Animations:

- fully functioning Underground & Open Cut
- from face to delivery is shown
- operational longwall
- capability to trigger emergency events
- strata control
- safe standing zones

# VR and Industry Training

## - Participation -



### 2010 Facility Use:

- **2000 people per month**
- **20,000 VRT platform usages**

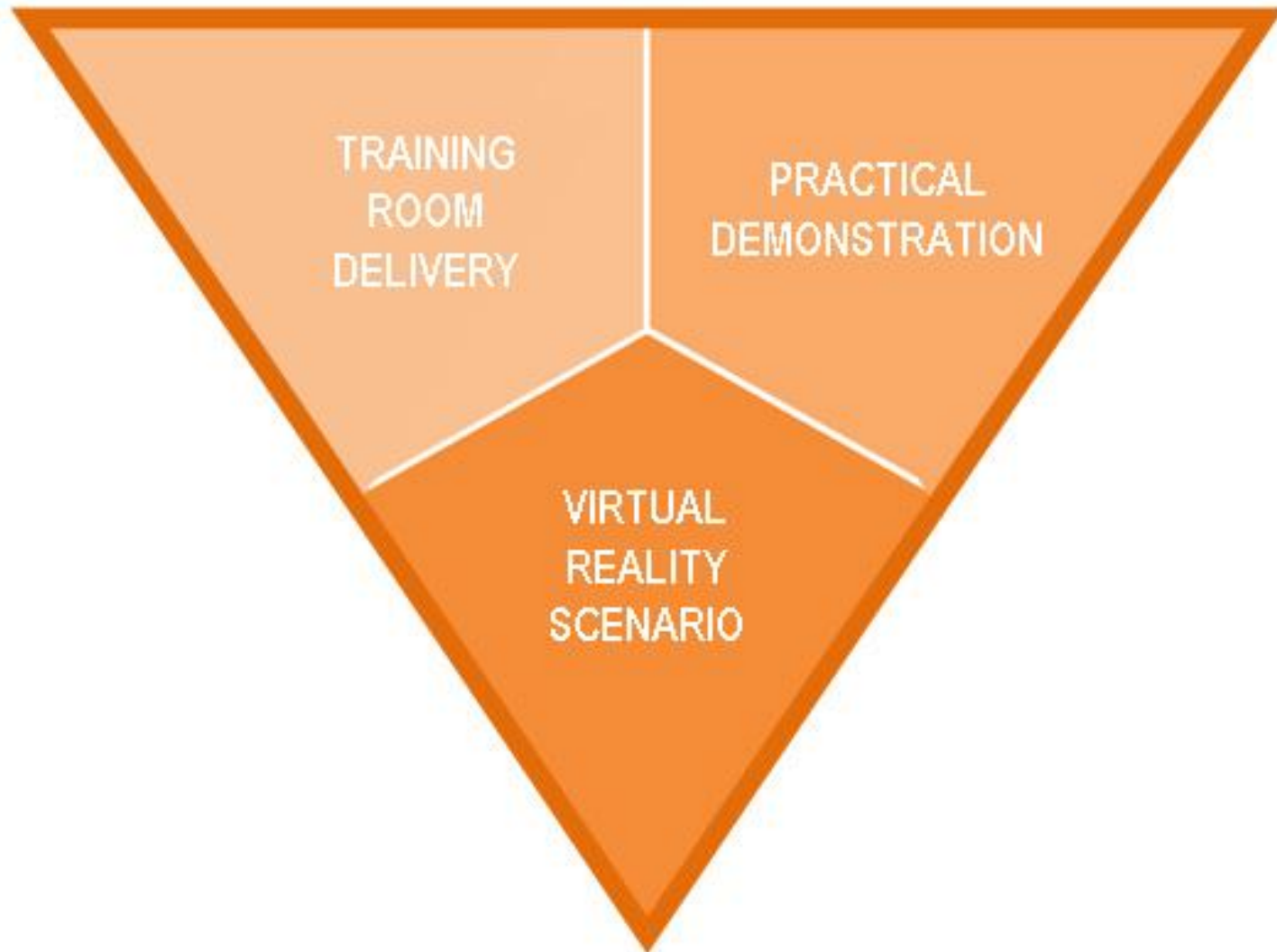
*...across our 4 training facilities in NSW*

### Wide Industry Interest:

- **UG & OC**
  - ✓ across NSW
  - ✓ Interstate (QLD)
  - ✓ International  
(China, US, Russia)

# NSW Mines Rescue Training Philosophy

## - The Training Triangle -



# NSW Mines Rescue Training

## - Our Training Philosophy -



*"Tell me...*

*and I may forget,*

*Show me...*

*and I may remember,*



*Involve me...*

*and I will understand"*





# The Virtual Mine Environment

## - The Training Benefits -

**EASY ACCESS**

SAFE EXPOSURE

EXTENDED SCENARIOS

RETENTION & RECALL

ASSESSMENT



# The Virtual Mine Environment

## - The Training Benefits -

EAS

**SAFE EXPOSURE**

EXTEN

RETENT

ASS



# The Virtual Mine Environment

## - The Training Benefits -

EAS

SAFE

**EXTENDED VIEW**

RETENT

ASS





# The Virtual Mine Environment

## - The Training Benefits -

EASY

SAFE

EXTEN

RETENTION & RECALL

ASSE





# The Virtual Mine Environment

## - The Training Benefits -

EASY A

SAFE EX

EXTEND

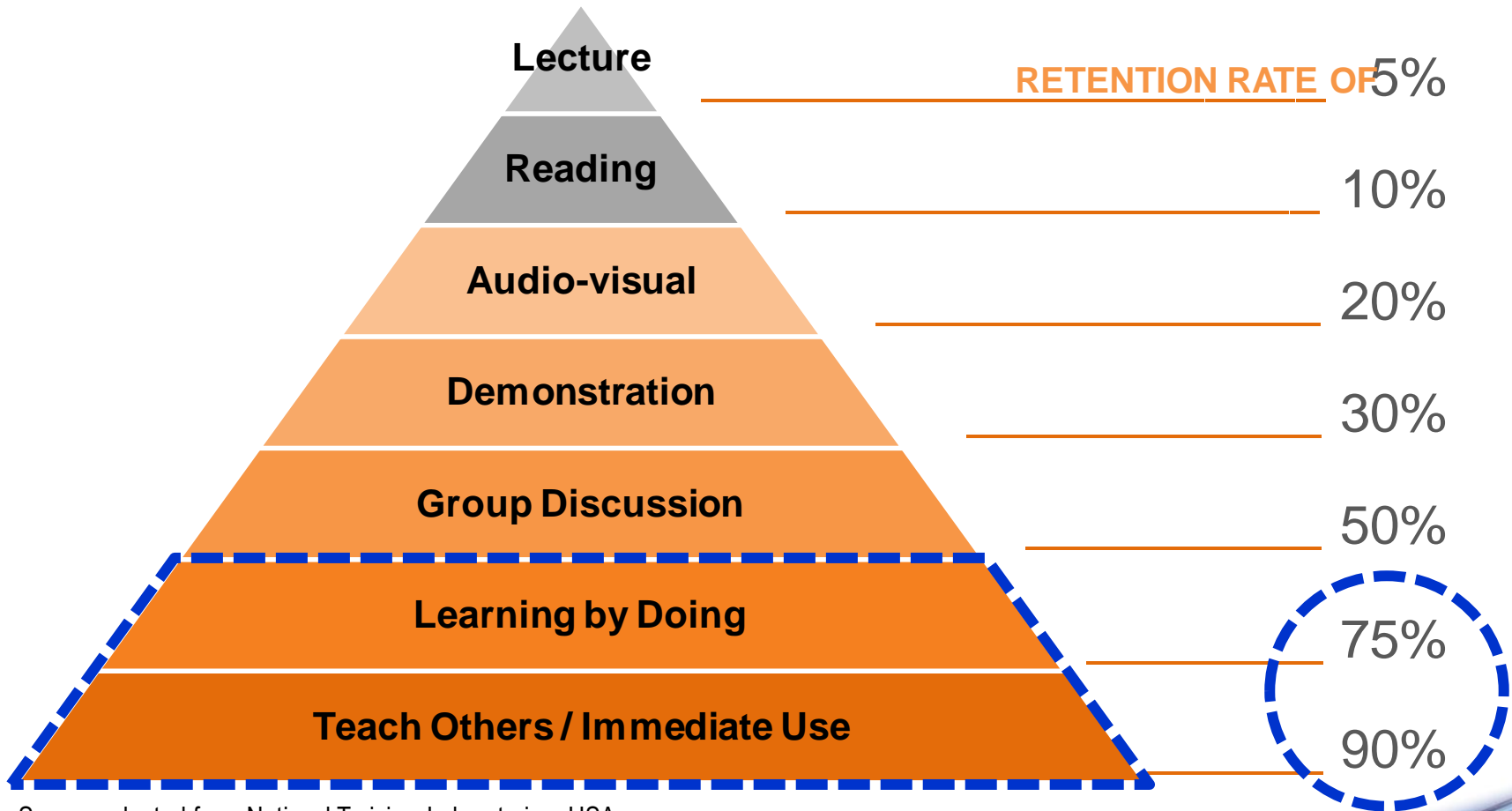
RETENTION

**ASSESSMENT**



# Training with a Virtual Learning Environment

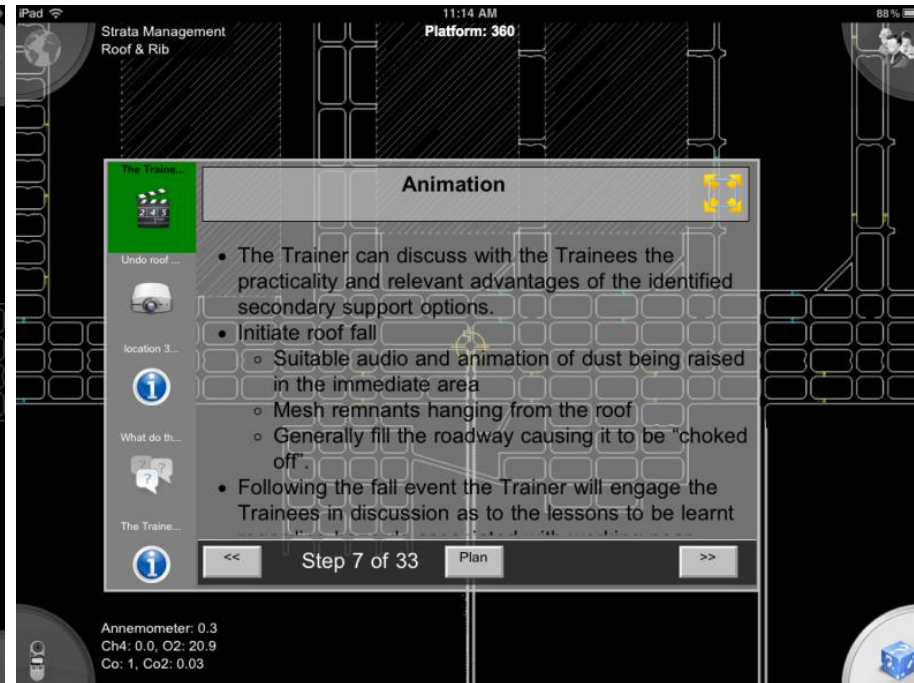
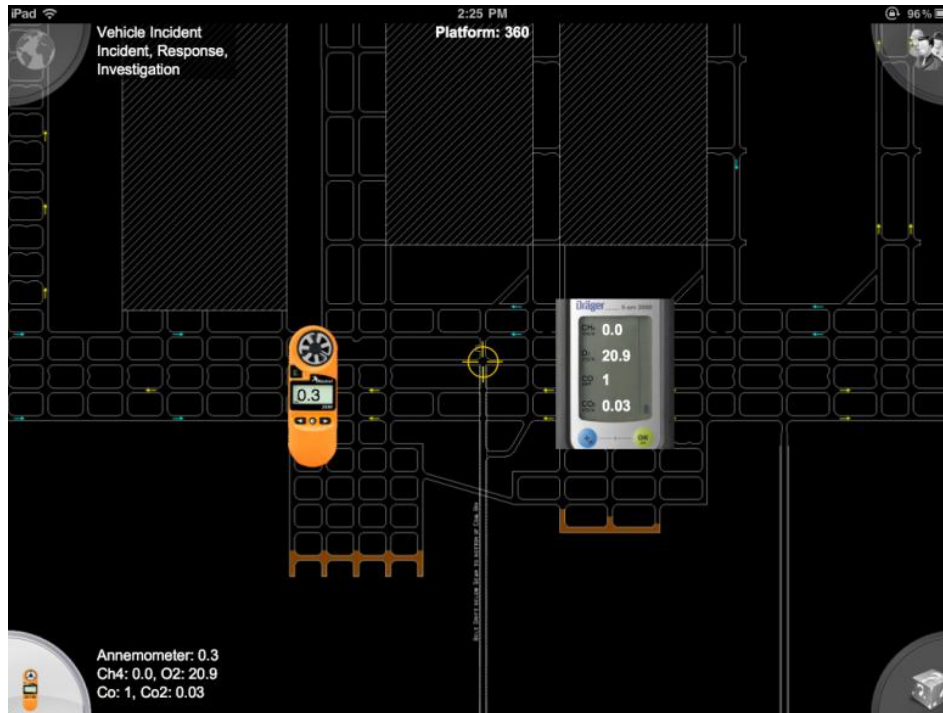
## Learning Retention Rates



Source: adapted from National Training Laboratories, USA

# VR Hardware & Facilities

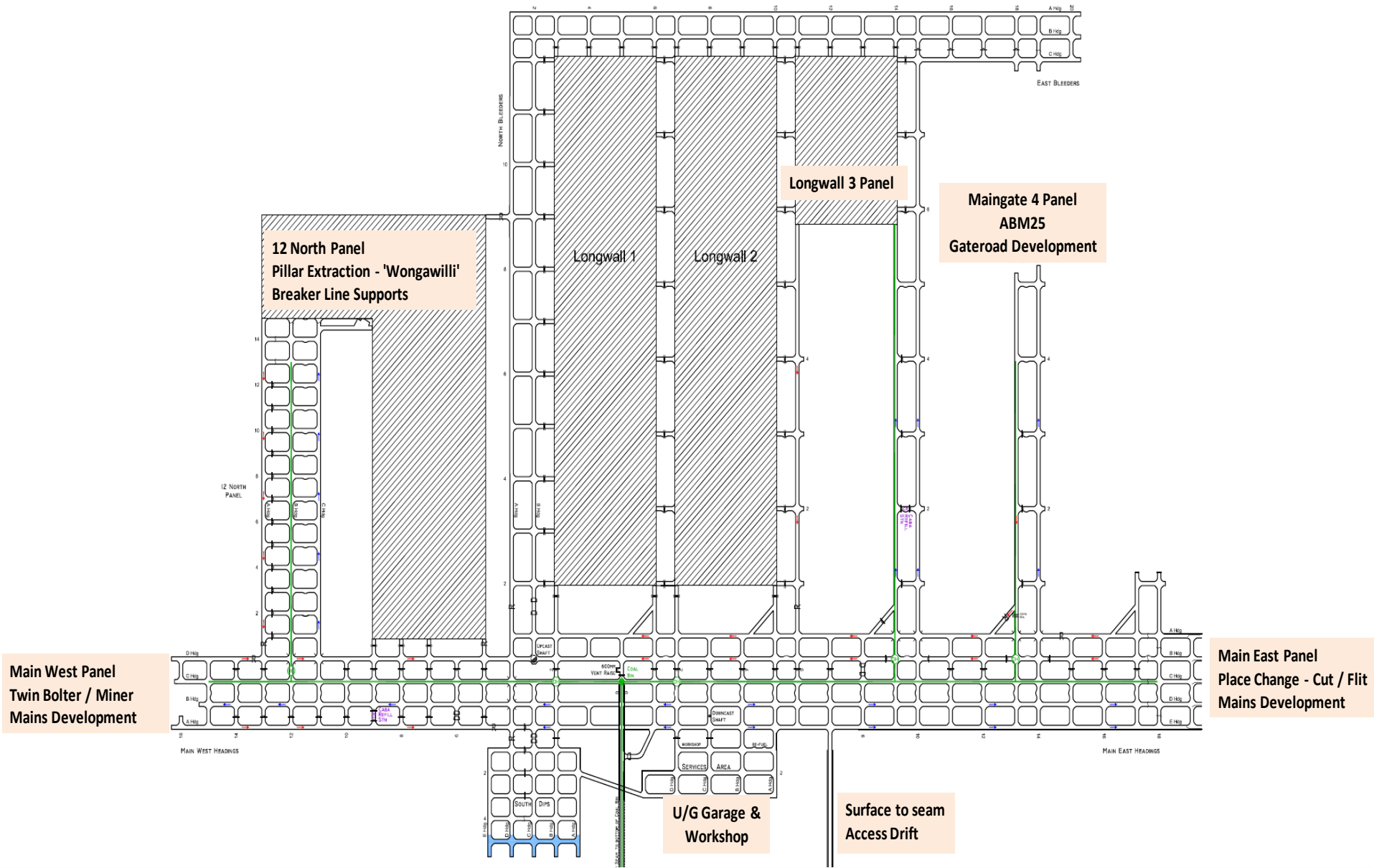
## - The "ROCK" -



## Rugged Operating Console (ROCK)

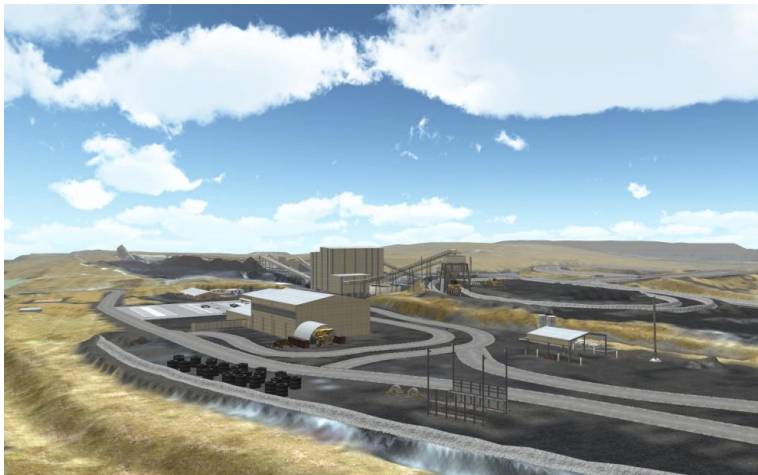
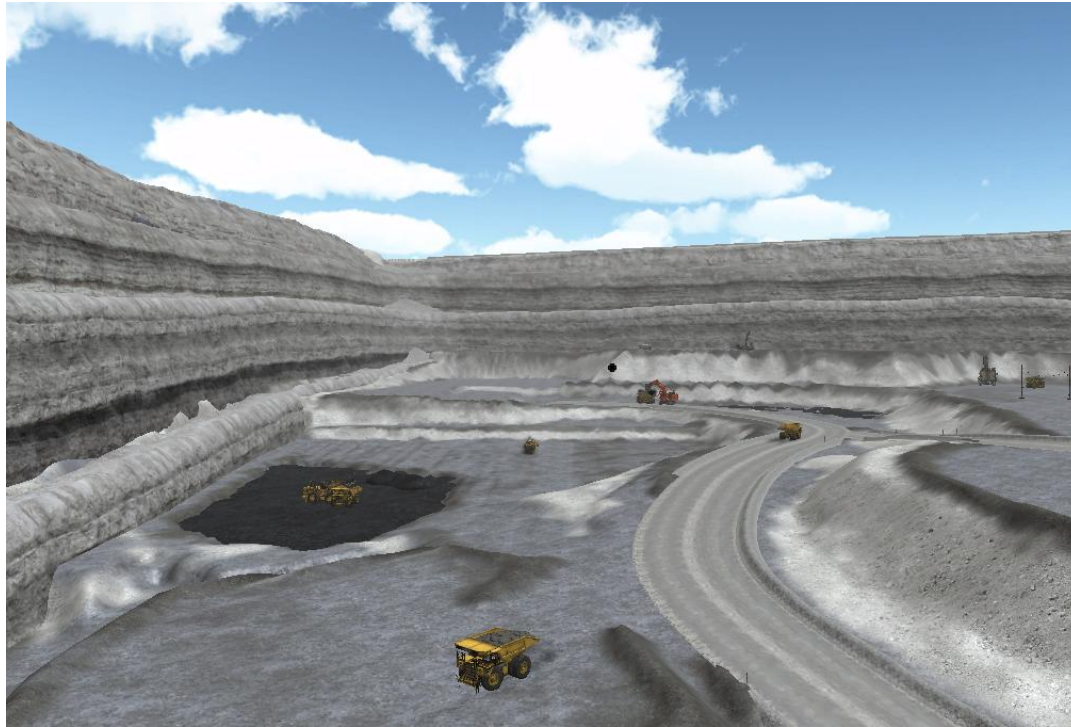
# “Performance” Underground Mine

## PERFORMANCE UNDERGROUND COAL MINE LAYOUT





# “Birdland” Open Cut Mine



# 3<sup>rd</sup> Generation Detail



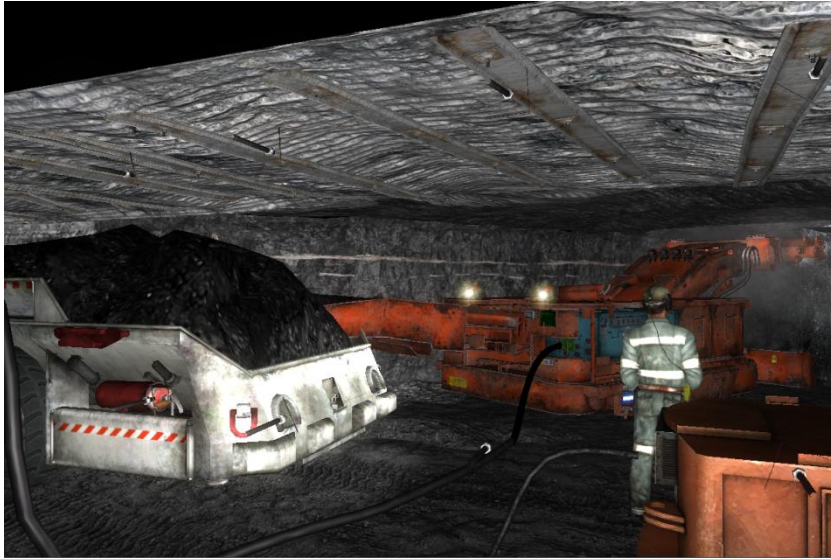
- Detailed and realistic operating mines providing full immersion for trainees
- Include environmental features such as mine gases, airflows and smoke
- Dynamically controlled and altered by events



- Events include fires, roof falls and explosions adaptable to training requirements
- Environmental changes in real time, wirelessly communicated to trainer and trainee
- 'Infopads' (iPods) for interaction with trainees

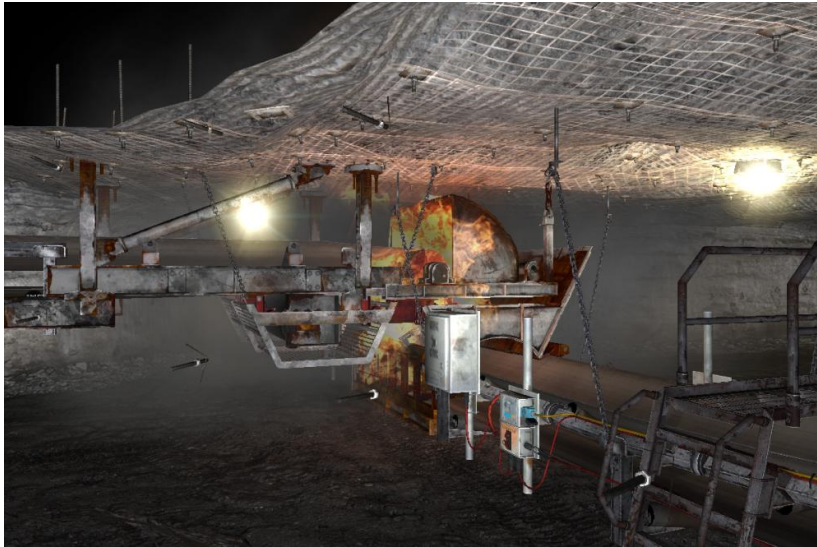


# 3<sup>rd</sup> Generation Detail



- Ability to modify scenarios expanding potential of VR training
- Trainees experience consequences of their actions, increasing learning retention
- Demonstrates mine core risks, providing perspectives not available at mine sites
- Adaptable to mine specific training
- Flexibility providing training for new employees through to mine officials
- Ability to apply to most hazardous industries

# 3<sup>rd</sup> Generation Detail



- Captures coal process from point of pick through to surface CHP
- MRS training to national competencies
- Applicable to 12 MRS Courses – UG Coal to Diploma and Emergency Preparedness
- Designed to meet ongoing training needs
- Importantly, ongoing consultation with stakeholders to meet challenges facing our industry



# Best Practice use of VR

## - More than Hardware & Software -

*What is most important is what is done in the virtual environment, not simply the technology itself.*



**VIRTUAL TRAINING**  
**SAFETY FOCUS**  
**REAL RESULTS**



*“Training for Tomorrow”*

**THANK YOU**