

SASOL
reaching new frontiers



Proximity Detection System: Inbound Equipment

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Points of Discussion

- Sasol Mining Strategy
 - *Background*
 - *Equipment*
 - *Zone Layout*
- Technological Challenges
- Photo's
- Trial
 - *Processes Followed*
 - *Installation Findings*
 - *Positive*
 - *Negative*
 - *Report and Tests*
- Additional Features
- Sasol Mining Way Forward



Sasol Mining Strategy: Background

- Risk Identified – Working in Proximity of Mining Equipment
- ZERO harm strategy – team assembled to investigate
- DME Newsletter indicating PDS to be used if possible

- Sasol Criteria developed
 - *Technical Requirements*
 - *Operational Requirements*

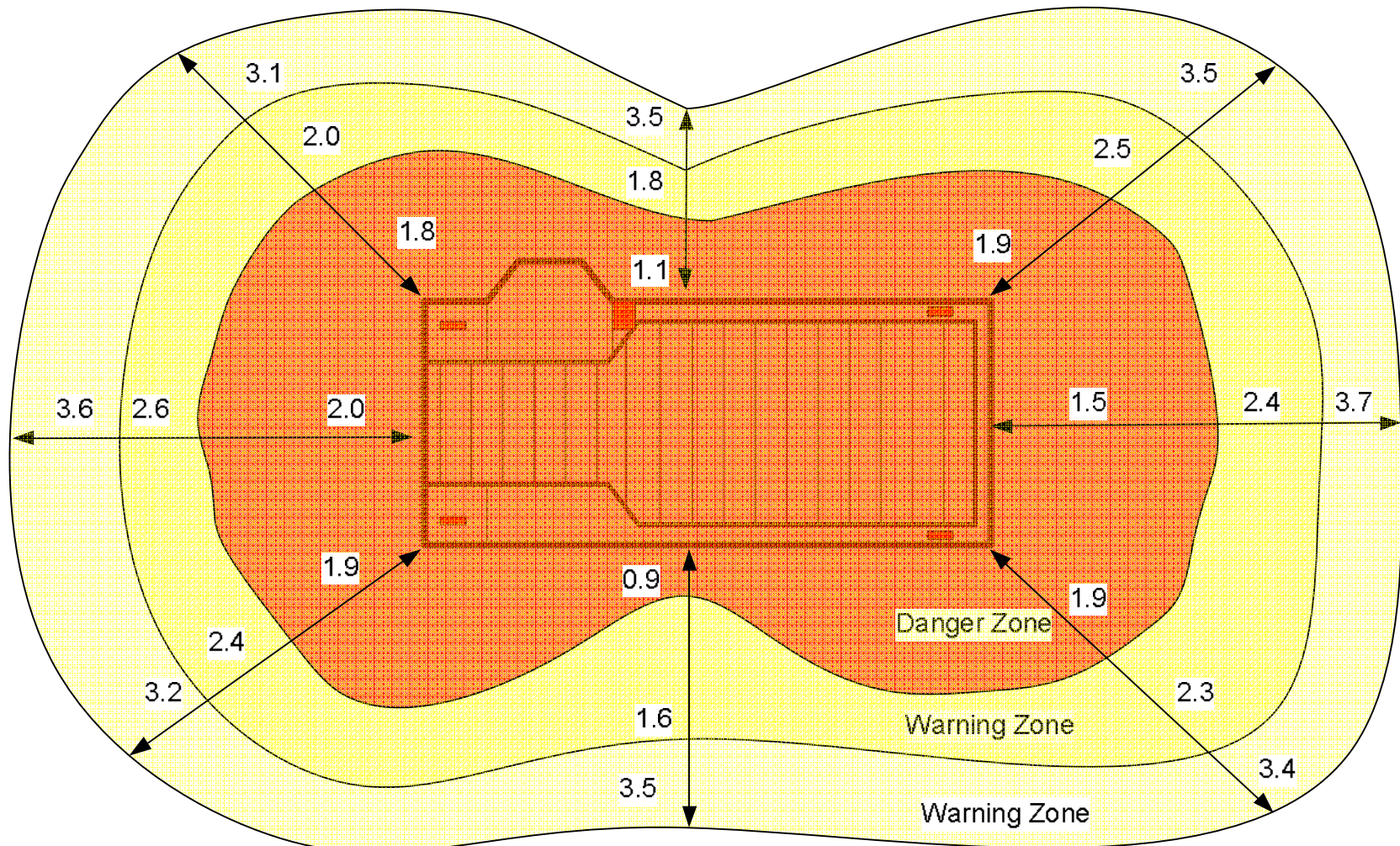
- Identified VLF as only solution
- Visit to 3 possible suppliers in the world to determine best solution



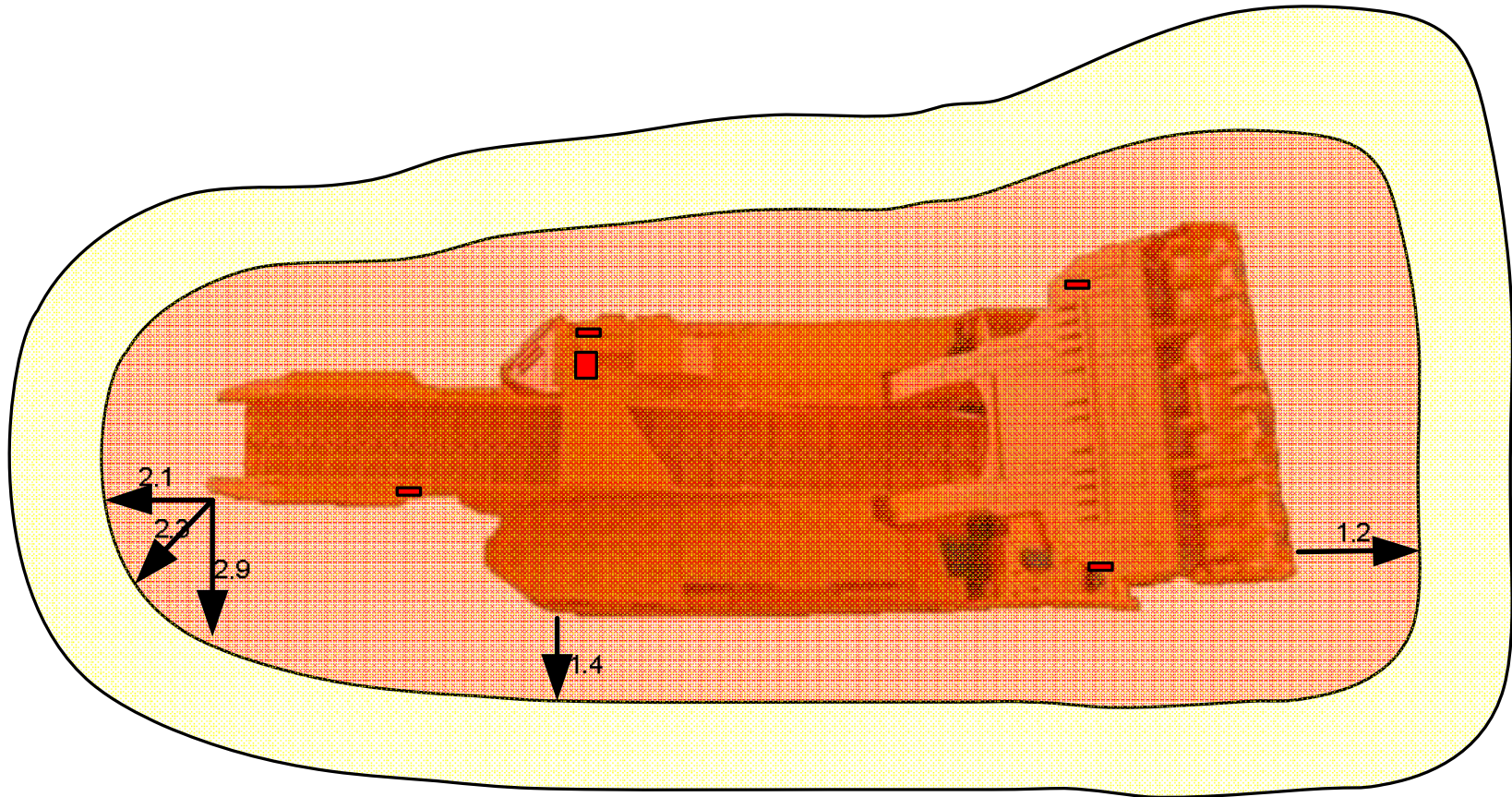
Sasol Mining Strategy: Equipment

- Completed
 - *CM*
 - *Feeder Breaker*
 - *SC's*
- To be evaluated
 - *RB*
 - *LHD*

Technology: Zone Layout: SC

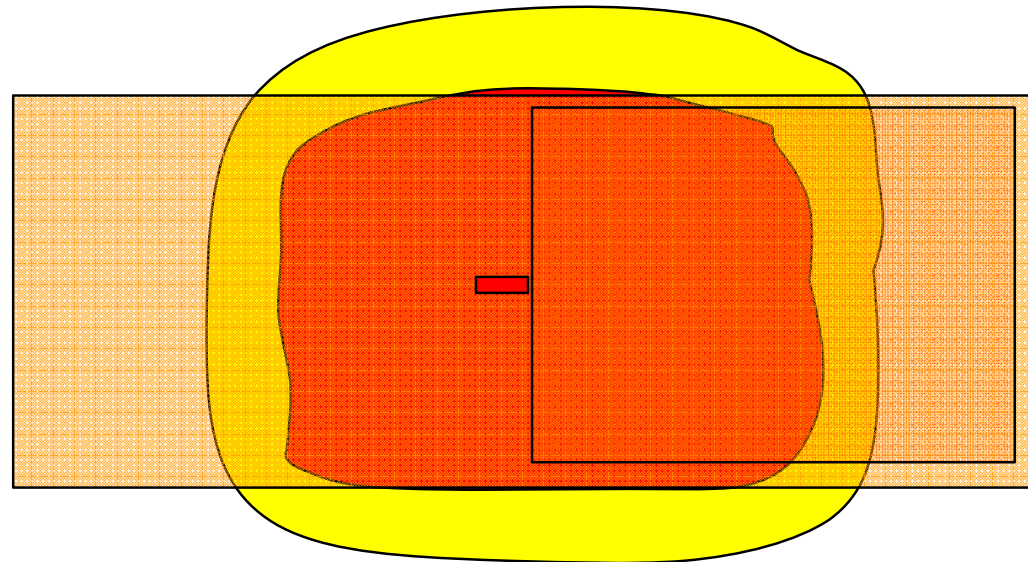


Technology: Zone Layout: CM



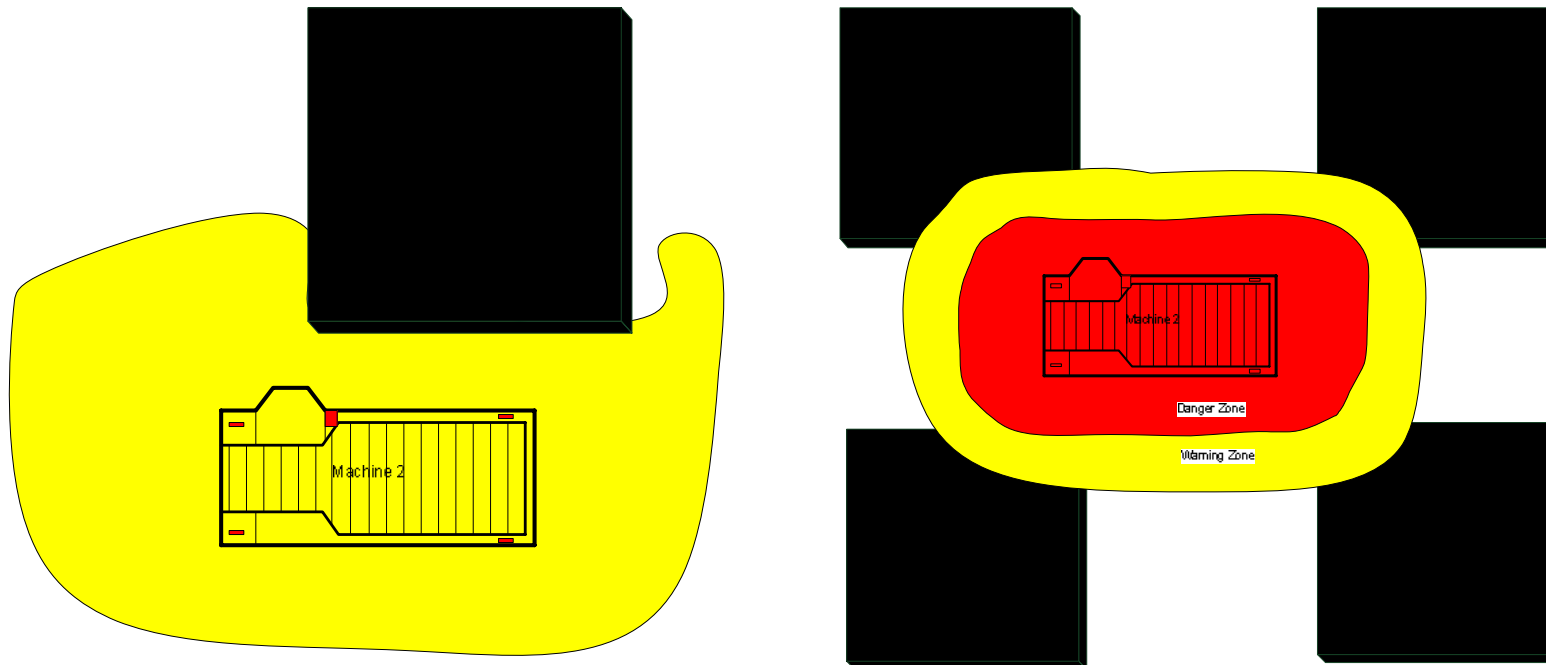


Technology: Zone Layout: FB

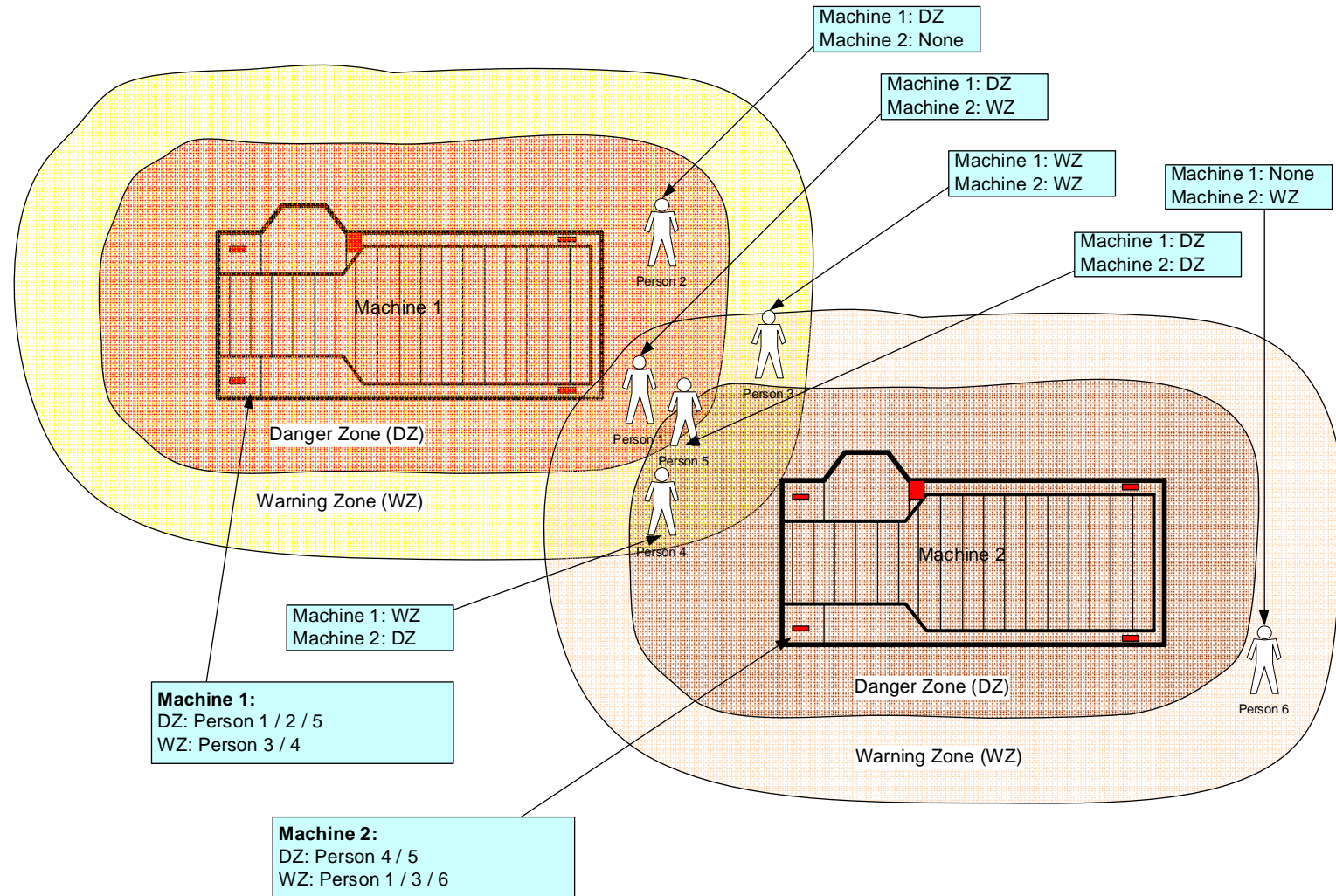




Technological Challenges: Coal Penetration and Zone Stability



Technological Challenges: Multi Vehicle / People Interaction





Photo's





Photo's





Trial Processes Followed

- Full Risk Assessment
 - *Current Situation*
 - *Action Taken*
- MOC Process
 - *Multiple Communication Session*
 - *Training: Classroom and u/g*
 - *Phased Approach for implementation*
 - *Regular feedback sessions*
- Technical Support
 - *Support Team on all production shifts*
 - *Spare equipment held in section*



Trial Findings: Installation

- Installation on all machines to be carefully planned.
- Position of controller boxes important on CM
- Cable Rooting very important
- Junction Boxes to have seals



Trial Findings: Positive

- System very reliable
- Equipment damage negligent
- System consistency very good
- No false indications
- Operator feedback very good
- Data collected very useful to address operational concerns
- Interlocks worked very well
- Machine coverage very good
- Improved overall safety awareness dramatically



Trial Findings: Negative

- Data collection still manual process – need to change to remote downloadable system

Trial Findings: Reports

Microsoft Excel - Close Proximity.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

Arial 10 B I U

C17 Night

TWISTDRAAI COLLIERY COLLISION AVOIDANCE SYSTEM

Merge SD Card Data

Machine Number: Merge Data

Machine Category:

Lamp No Category:

Date From: 2009/01/06 Date To: 2009/01/13

File Path and Name: C:\My Documents\C Drive\Close Proximity\Data.txt

Machine Number:

Lamp No:

Shift Type: Read File Data

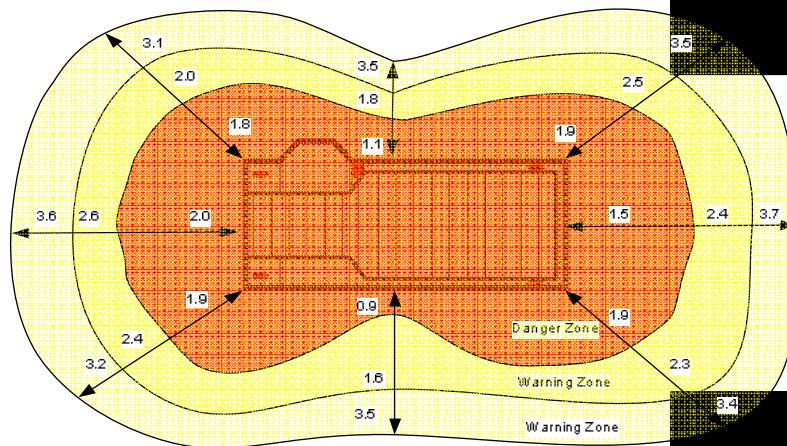
	Date	Time	Shift	Machine No	Lamp No	Zone	Menu Button Status	Switch 1 Status	Switch 2 Status	Battery Status
12	2009/01/09	11:52	Day	SC0208	5039	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
13	2008/11/30	04:59	Night	SC0176	5022	Monitor Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
14	2008/11/30	10:14	Day	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
15	2008/11/30	10:14	Day	SC0176	5022	Monitor Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
16	2008/11/30	04:59	Night	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
17	2008/11/30	04:59	Night	SC0176	5022	Monitor Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
18	2008/11/30	16:14	Aft	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
19	2008/11/30	16:14	Aft	SC0176	5022	Monitor Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
20	2008/11/30	20:13	Aft	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
21	2008/11/30	20:13	Aft	SC0176	5022	Monitor Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
22	2008/11/30	23:13	Aft	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
23	2008/11/30	23:13	Aft	SC0176	5022	Monitor Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
24	2008/11/30	04:59	Night	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
25	2008/11/30	04:59	Night	SC0176	5022	Monitor Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
26	2008/11/30	08:13	Day	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
27	2008/11/30	08:13	Day	SC0176	5022	Warning 1 Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
28	2008/11/30	09:14	Day	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
29	2008/11/30	09:14	Day	SC0176	5022	Warning 1 Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
30	2008/11/30	04:59	Night	SC0176	5045	Safe Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
31	2008/11/30	04:59	Night	SC0176	5022	Warning 1 Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
32	2008/11/30	04:59	Night	SC0176	5033	ID Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok
33	2008/12/01	07:26	Night	SC0176	5021	ID Zone	Menu Button Off	Switch 1 Off	Switch 2 Off	Battery Ok

Lamp & Mach No / Sheet1 / File Data / Info / Data Format

Ready NUM

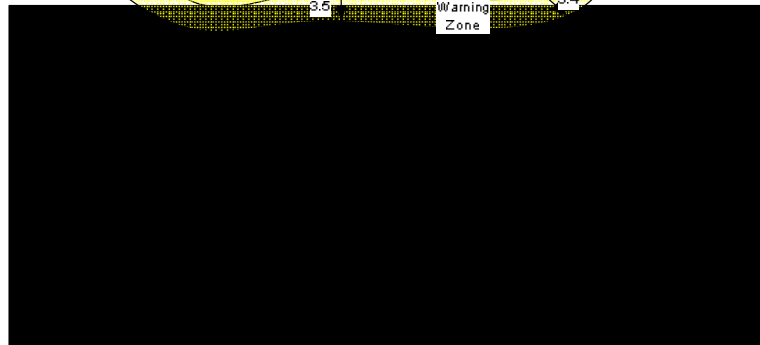
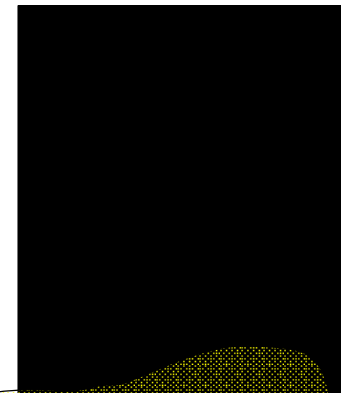
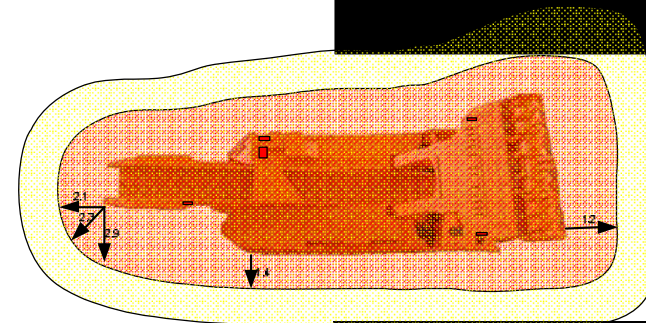
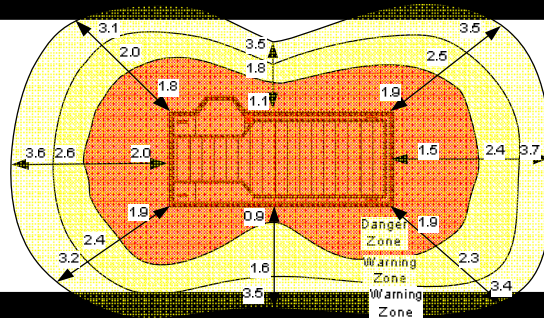
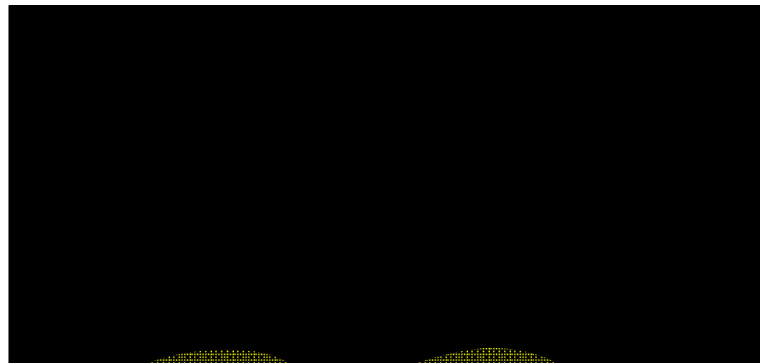


Test Underground





Test Underground





Additional Features

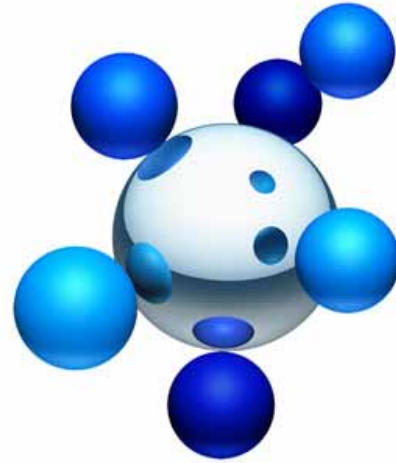
- These features are not included in the trial
- Vehicle – Vehicle collisions
- Shaft Clearance
- Surface Systems
- Outbound systems
- Mobile Units
- Last line of support detection
- Trapped miner location (up to 110m) TTE technology
- Miner Tracking
- Vehicle intersection detection
- Operator licensing
- Lamp room management system
- Radio Communication around machines



Sasol Mining Way Forward

- Complete Trial at Twistdraai East Colliery for outstanding equipment
- Determine Roll-out Strategy
- Start Roll-out
- Start trial with some additional features
- Implement Additional Features

QUESTIONS ??



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