From: Stuart McLean [mailto:S.Mclean@minesite.com.au]
Sent: Monday, August 18, 2008 2:34 AM
To: zzMSHA-Standards - Comments to Fed Reg Group
Subject: RIN 1219-AB58 - Refuge Alternatives for Underground Coal

Please find attached our comments regarding Refuge Alternatives for Underground Coal Mines; Proposed Rule.

The response is specific to:

Federal Register / Vol. 73, No. 116 / Monday, June 16, 2008 / Proposed Rules
Page - **34163**
Section 75.1600–3 Communications
Facilities; Refuge Alternatives

Kind Regards,

Stuart McLean
Engineering Manager
Mine Site Technologies

AB58-COMM-24

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MINE SITE TECHNOLOGIES

RIN 1219-AB58

Part IV

Department of Labor

Mine Safety and Health Administration
30 CFR Parts 7 and 75
Refuge Alternatives for Underground Coal Mines; Proposed rule

With regards to: **Federal Register** / Vol. 73, No. 116 / Monday, June 16, 2008 / Proposed Rules
Page - **34163**
Section 75.1600–3 Communications
Facilities; Refuge Alternatives

Paragraph (a) would require that refuge alternatives be provided with a two-way communication system and an additional communication system when approved in the mine operator's Emergency Response Plan.
Communications with the persons in refuge alternatives are vital to mine rescue efforts. The knowledge of where miners are in refuge alternatives, their condition, and the conditions in the mine may make the difference between life-and-death in a post-accident crisis.
Paragraph (a)(1) would require a two way communication facility that is a part of the mine communication system, which can be used from inside the refuge alternative. The communications device must be usable without further exposing persons to smoke and toxic gases. MSHA solicits comments on the proposed two-way communication facility. Please be specific in your response, including alternatives, rationale, safety benefits to miners, technological and economic feasibility, and data to support your comments.
Paragraph (a)(2) would require an additional communication system when approved in the operator's Emergency Response Plan (ERP).

Pre-amble.
As MSHA is soliciting comments on a proposed two-way communication facility, Mine Site Technologies (MST) is attending MSHA's public hearings and making comment to inform MSHA (and others) that MST are actively working on a dedicated and truly wireless solution for communications with refuge structures.

Overview.
Mine Site Technologies has spent 20 years designing and developing mining specific communication systems dedicated for use in underground coal environments and always with an emphasis on safety.

MST have been widely known for their "Through the Earth" communications technology and recent collaboration with Australia's "**Commonwealth Scientific and Industrial Research Organisation (CSIRO),** have developed and demonstrated a "Proof of Concept" 2 way system highly suited to refuge environments.

MST proposes a communications system suited to a refuge & rescue environment consisting of a near field (magnetic) Bi-Directional (2 way) synchronous Through the Earth (TTE) communications link.

This link will provide the miner retreating to a refuge with the ability to send and receive text messages from the surface without any dependence on extensive underground infrastructure, such as antennas cables or numerous underground nodes or devices that would possibly be destroyed or severely disabled in any major incident underground.

The communication link's proprietary protocol and modulation scheme are noise tolerant, advantageous, self adjusting and specifically devised to provide a robust transfer of data considerate of the noise and geophysical strata typically associated with underground coal mining environments (inclusive of surface noise).

The system consists of a permanently fixed refuge based unit assigned as a "Slave" whilst the "Master" unit is intended to be portable and would be deployed on the surface above the refuge (collinear with the refuge unit). The master unit can also be deployed beside the refuge e.g. on the other side of a rock-fall, mine collapse or hazard (coplanar with the refuge unit).

Other than distinctly different power requirements/ components, both units have 3 primary elements.

- High sensitivity receiver.
- Simple single turn transmit antenna
- The actual Slave/ Master units – electronics, hardware and the user interface.

The Refuge Slave.

- Devised to provide 96 hours of operation – 48 hrs @ 100% duty and a further 48 hrs at a reduced duty of 50%.
- Continually outputs a beacon type signal consisting of its designation, occupied state of the refuge, power status and could possibly be interfaced with other refuge facilities to provide useful information e.g. Air quality etc.
- Once contacted by a Master it adopts synchronous communications as dictated by the Master where Quality of Signal will dictate communications rates.
- Tactile QWERTY keyboard – backlit - cognisant of low to zero light environments.
- Cognisant of the need to provide efficiency thus minimal impact to the thermal state of the refuge.
- LCD screens indicating link status, sent and received messages, logging, scrolling etc.
- A variety of audible and visual aids as to system status and user input response.
- The system is intuitive and instructions (both printed and reinforced on the LCDs) assist the miner in proper use of the system.
- Able to repeat signals from other refuge units within range of refuge unit but may be isolated from the Master.

The Surface Master

As above including:

- Portable – easy deployable.
- An ability to associate with up to 3 refuge units – directly or sequential serially.
- Dictates all communications – selectable normal and Deep Mine (or high noise) mode.

Mine Site Technologies are now in the development phase of production ready units for submission to MSHA and other Intrinsically Safe approval entities.

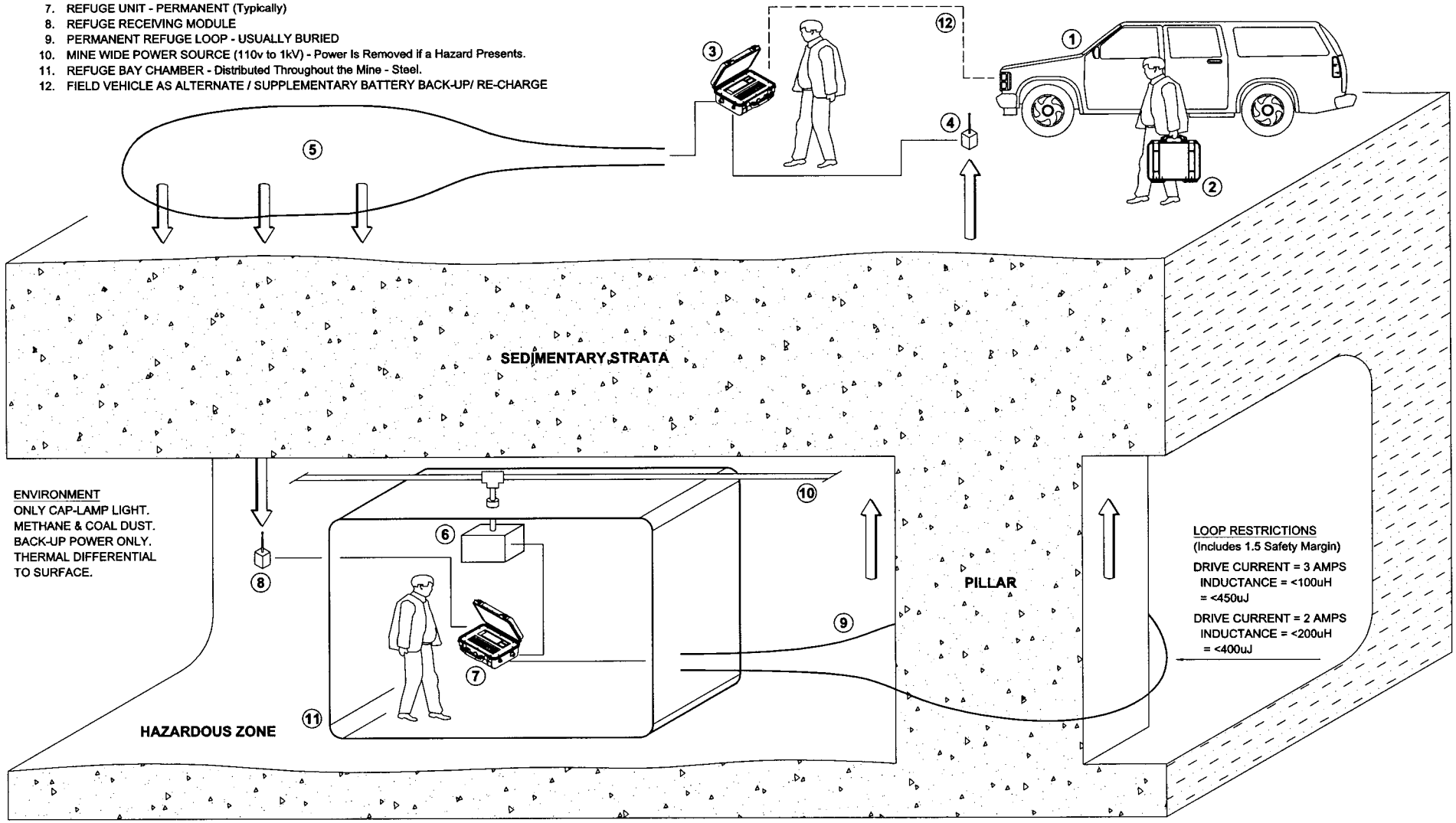
Attached drawings provide a general view of the concept of the system.

Yours faithfully,

Stuart Mclean
Engineering Manager
Mine Site Technologies Pty Limited.

KEY
1. FIELD VEHICLE DEPLOYED
2. SURFACE UNIT DELIVERED TO APPROPRIATE AREA - MARKER/ GPS DEFINED etc.
3. SURFACE UNIT - PORTABLE - Can Communicate with up to 3 Refuge Units
4. SURFACE RECEIVING MODULE
5. SURFACE DEPLOYED LOOP
6. INTRINSICALLY SAFE SUPPLY & BATTERY BACK-UP
7. REFUGE UNIT - PERMANENT (Typically)
8. REFUGE RECEIVING MODULE
9. PERMANENT REFUGE LOOP - USUALLY BURIED
10. MINE WIDE POWER SOURCE (110v to 1kV) - Power Is Removed if a Hazard Presents.
11. REFUGE BAY CHAMBER - Distributed Throughout the Mine - Steel.
12. FIELD VEHICLE AS ALTERNATE / SUPPLEMENTARY BATTERY BACK-UP/ RE-CHARGE

ENVIRONMENT
EXTREME WEATHER
HIGH LEVELS OF ELECTRICAL / INTERFERENCE NOISE
PORTABLE POWER ONLY
RESTRICTIVE TERRAIN?



NOTES:
PROVISSIONAL (CONCEPT ONLY)

SCALE DNS

REV	ECO	REVISION NOTE	DRN	APP	DATE
A		PROVISSIONAL	SMcL		19/3/08
B					
C					
D					
E					
F					
G					

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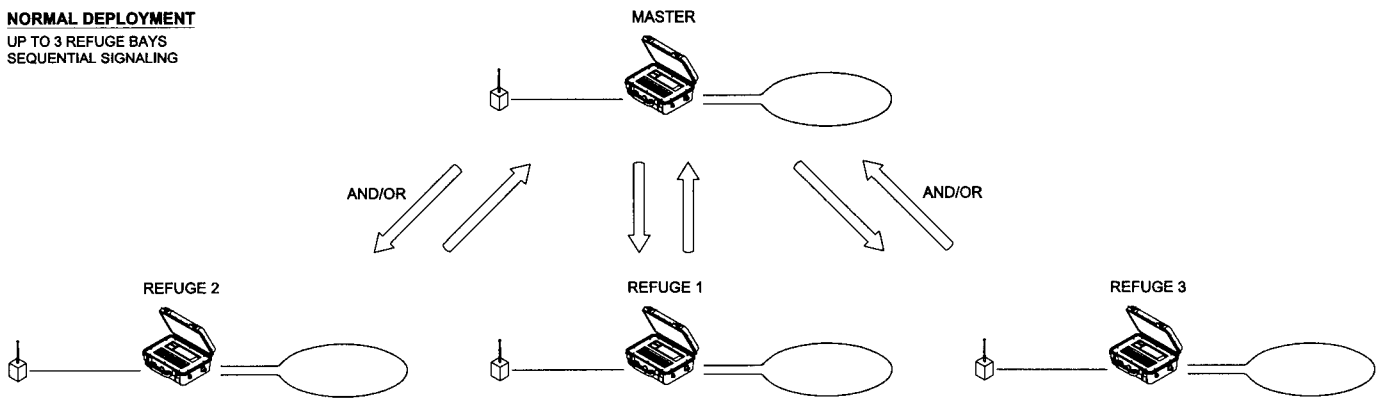
PRODUCT REFUGE BAY PED
ASPECT SYSTEM COMPONENTS
SHOWING EXPECTED DEPLOYMENT

DRAWING/CAD REFERENCE RBP_001
REV P
DATE 19-03-2008
SHEET 1 OF 1

NORMAL DEPLOYMENT

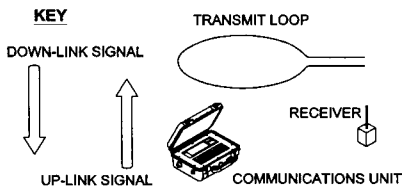
UP TO 3 REFUGE BAYS
SEQUENTIAL SIGNALING

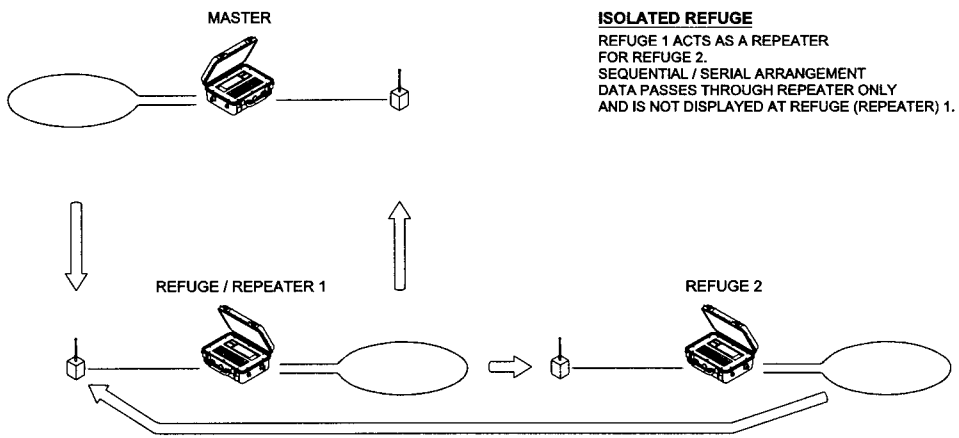


CONSIDERATIONS

> 48 HOUR CONTINUOUS DUTY.
> 96 HOUR REDUCED DUTY
-REFUGE UNITS ALWAYS POWERED
-REFUGE CONTINUALLY BEACONS - ID, POWER STATUS, OTHER STATIONS SEEN & IF REFUGE IN USE.
-BEACON DUTY SUITABLE FOR A 5 MINUTE SEARCH FOR A POSITIVE RESPONSE.
-REFUGE LISTENS FOR OTHER STATIONS.
-INVOKE "SNOOZE" CYCLES ONCE LINK ESTABLISHED TO EXTEND OPERATING TIME.
-MASTER CAN BE DEPLOYED ABOVE SURFACE OR UNDERGROUND eg. AT A ROCK FALL.
-NO USER COMMS BETWEEN REFUGES - ALL USER COMMS VIA MASTER.

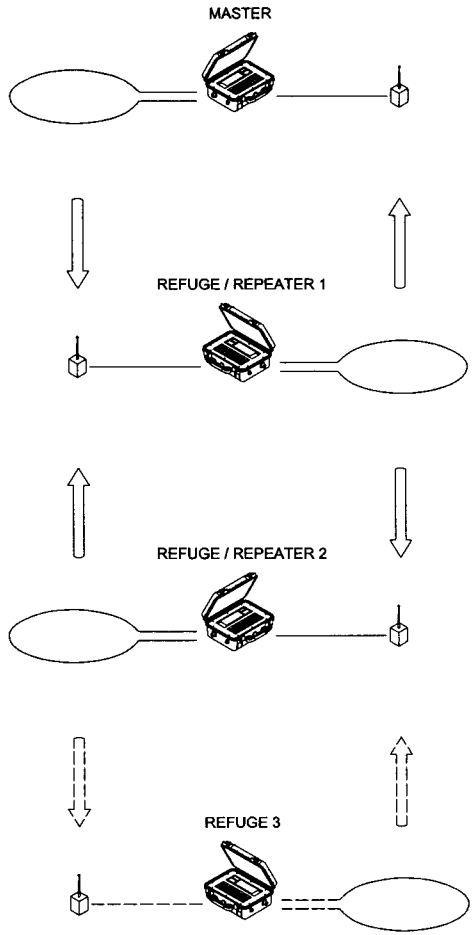
KEY





ISOLATED REFUGE

REFUGE 1 ACTS AS A REPEATER FOR REFUGE 2.
SEQUENTIAL / SERIAL ARRANGEMENT
DATA PASSES THROUGH REPEATER ONLY AND IS NOT DISPLAYED AT REFUGE (REPEATER) 1.



HARDROCK MINE DEPLOYMENT (DECLINE)

REFUGE 1 ACTS AS A REPEATER FOR REFUGE 2
REFUGE 2 ACTS AS A REPEATER FOR REFUGE 3
SEQUENTIAL / SERIAL

NOTES:
PROVISSIONAL (CONCEPT ONLY)

SCALE **DNS**

REV	ECO	REVISION NOTE	DRN	APP	DATE
A		PROVISSIONAL	SMcL		10/4/08
B					
C					
D					
E					
F					
G					

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PRODUCT: REFUGE BAY PED
ASPECT SHOWING: DEPLOYMENT
ANTICIPATED ARRANGEMENTS

DRAWING/CAD REFERENCE: **RBP_002**
REV: **P**
DATE: **10-04-2008**
SHEET 1 OF 1