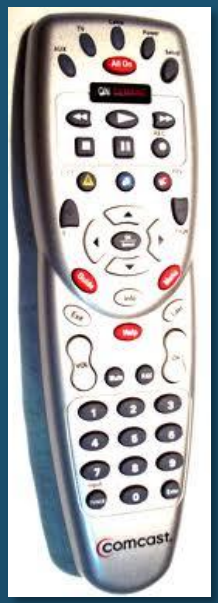
Proximity Detection in a Mine Wide Application

Mike Berube
President & COO
Strata Worldwide

STRATA WORLDWIDE

Repeatability and simplicity is the key to success



Humans are creatures of habit.
We like routines

How do we make proximity routine?
Repeatable, Simple, and Predictable

The human factor will ultimately constrain what is practical and effective underground

STRATA WORLDWIDE

What the user wants from Proximity?

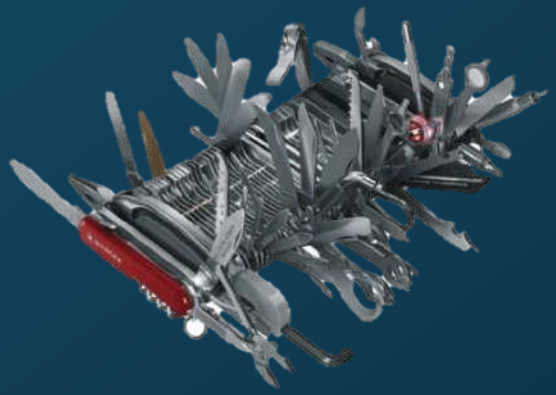
A failsafe system to aid in the enforcement of red-zones

A system that trains safe practices in the mine

A system that does not effect production

What the user **needs**

User wants to **slice an Apple**



What can be **offered**

STRATA WORLDWIDE

Background and Experience

Nine years of R&D and five years of deployment, HazardAvert® is active in all types of mines, including underground coal, hard rock & surface

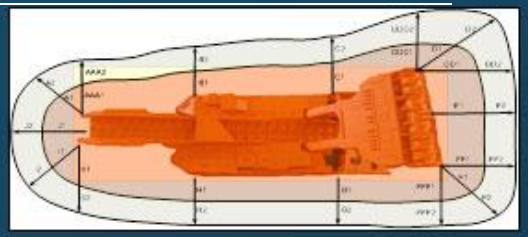
With a growing global reach, Strata has HazardAvert® customers in United States, South Africa, Canada, Australia, Chile & Papua New Guinea

Over 1,000 active systems around the world

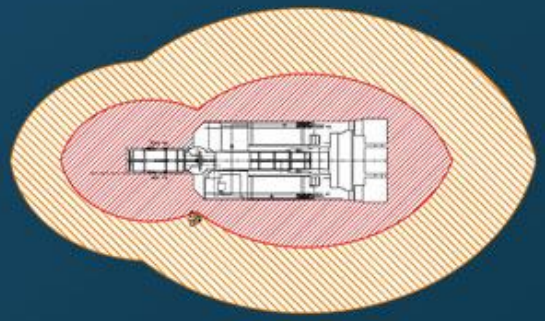
- Shuttle Cars, 16 and 20 ton
- Coal Haulers, battery
- Roof Bolters, single and double boom
- Feeder Breakers, single and three way dump
- Continuous Miners, place change and full face
- Load Haul Dumps, diesel
- Longwalls
- Scoops
- Front end loaders
- Haul Trucks
- Light duty vehicles
- Dozer
- Dragline
- Drills

STRATA WORLDWIDE

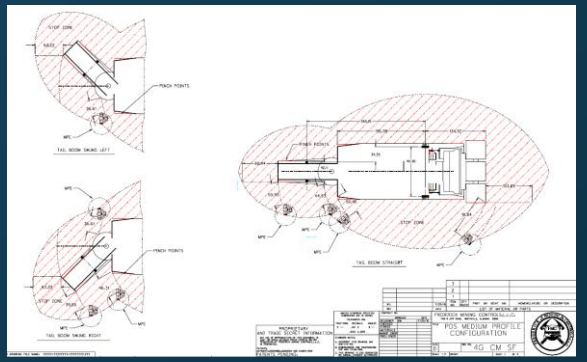
What have we offered



- Static zones
  - 2007 to present RSA
  - 300 number pieces of equipment at Sasol alone
- Configurable zones
  - 2010 to present
  - Mine entries in the US are narrower than RSA
  - US had a greater focus on technology and what could be achieved



- Configurable and Dynamic zones
  - 2011 to present
  - Created highly flexible systems in anticipation of US mandate
  - Driven by US mine requirements

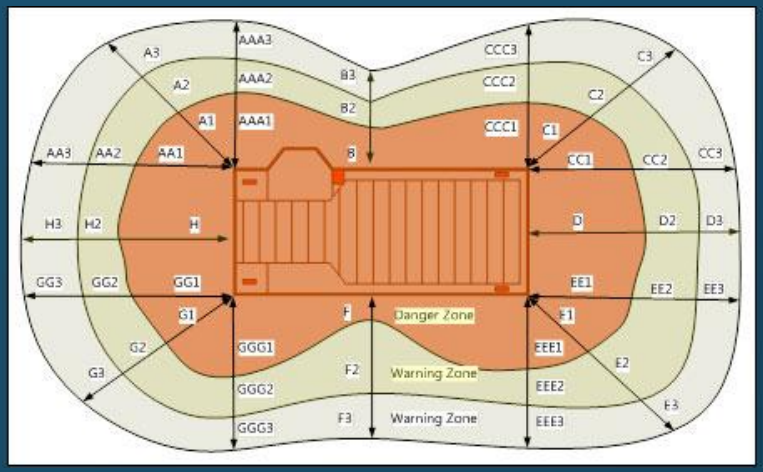


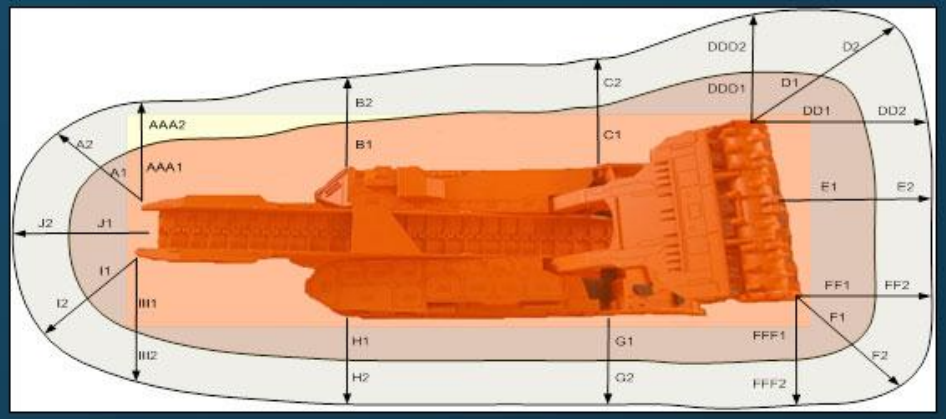
STRATA WORLDWIDE

Static Zones

Zones never change size or shape while in operation

Zone sizes are consistent across machine type





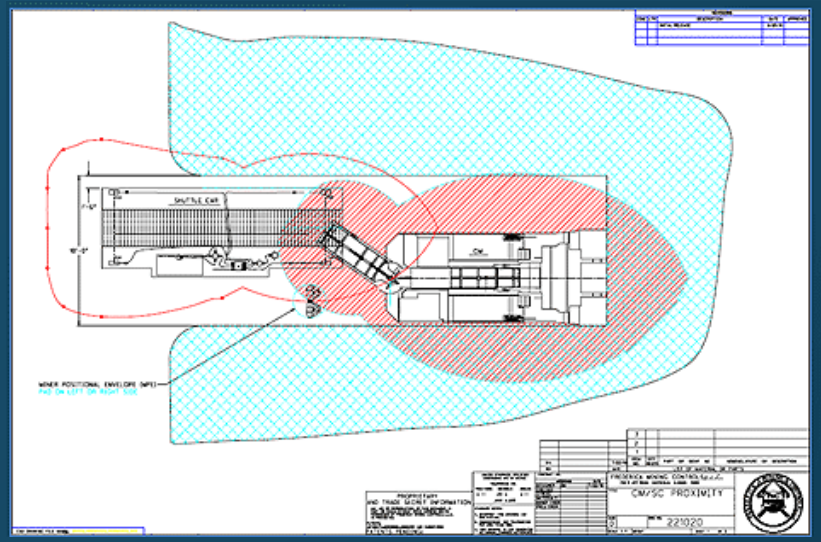
STRATA WORLDWIDE

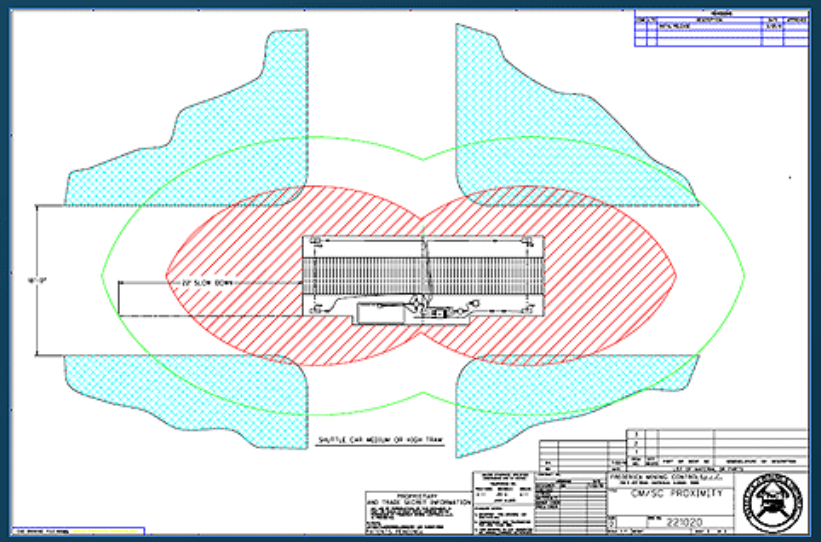
Configurable Zones

Zones never change size or shape while in operation

Zone sizes may be tuned machine-to-machine

- Multiple zones
- Distance of zones from the machine
- Shaped and articulating of zones





STRATA WORLDWIDE

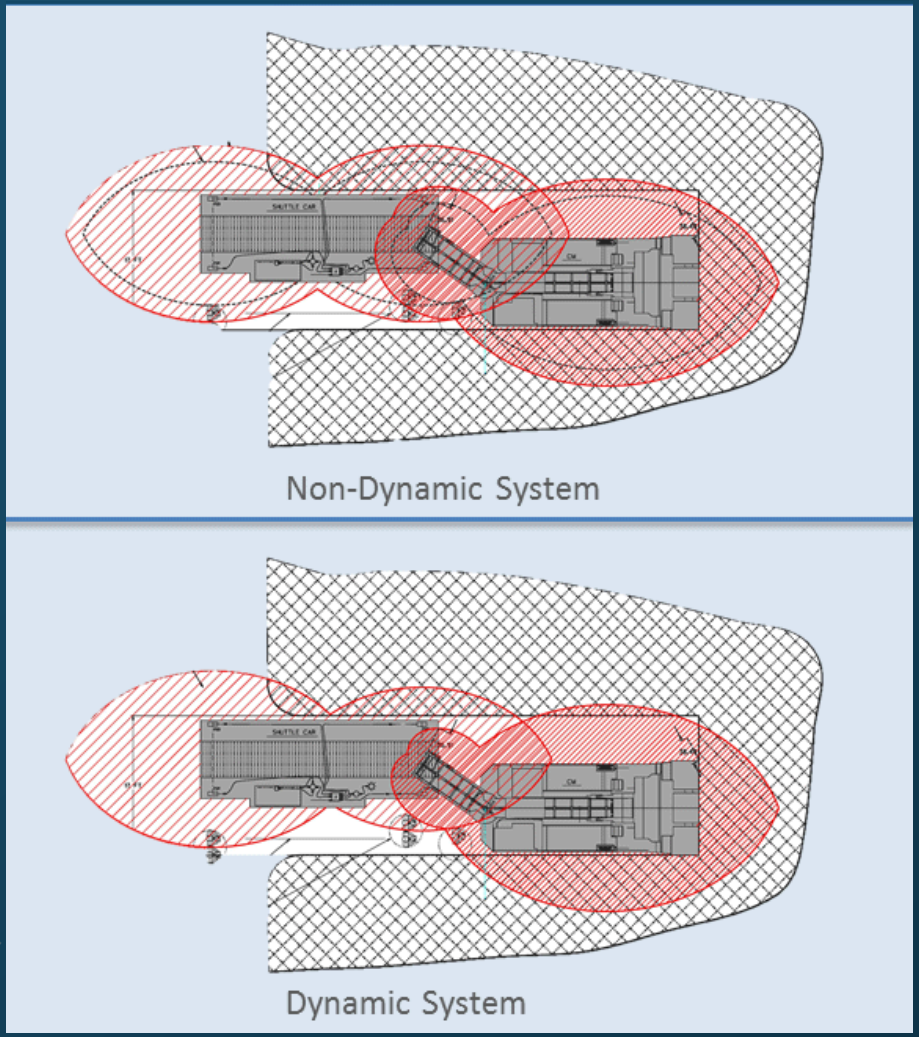
Configurable and Dynamic Zones

Configurable

- Multiple zones
- Distance of zones from the machine
- Shaped and articulating zones

Dynamic

- Zone shape or distance based on speed of equipment
- Zone shape or distance based on input from the machine
- Zone shape or distance based on input from operator PAD
- Zone shape or distance based on interaction with another piece of equipment



STRATA WORLDWIDE

Where are we now?

We have almost come full circle

Highly refined static zones

What needs to be considered:

Not all of the machines operate in the same fashion

Miners on foot interact with machines differently

Training

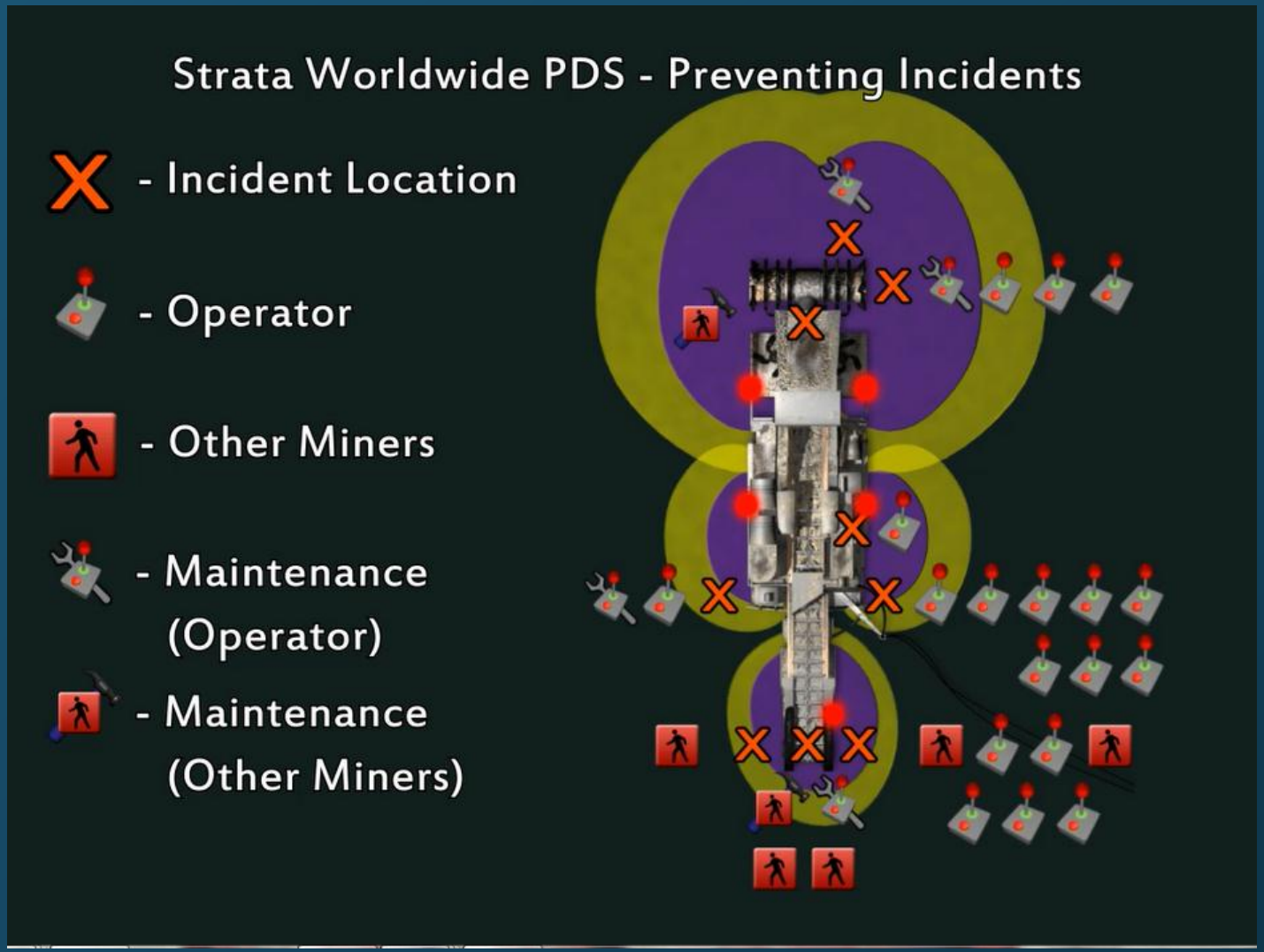
Zone inspections

Miners can't see zones

Shape static fields in such a way that a miner's exposure to red zones is prohibited even when machines are in close proximity to one another, while not impacting production

STRATA WORLDWIDE

Where are we now?

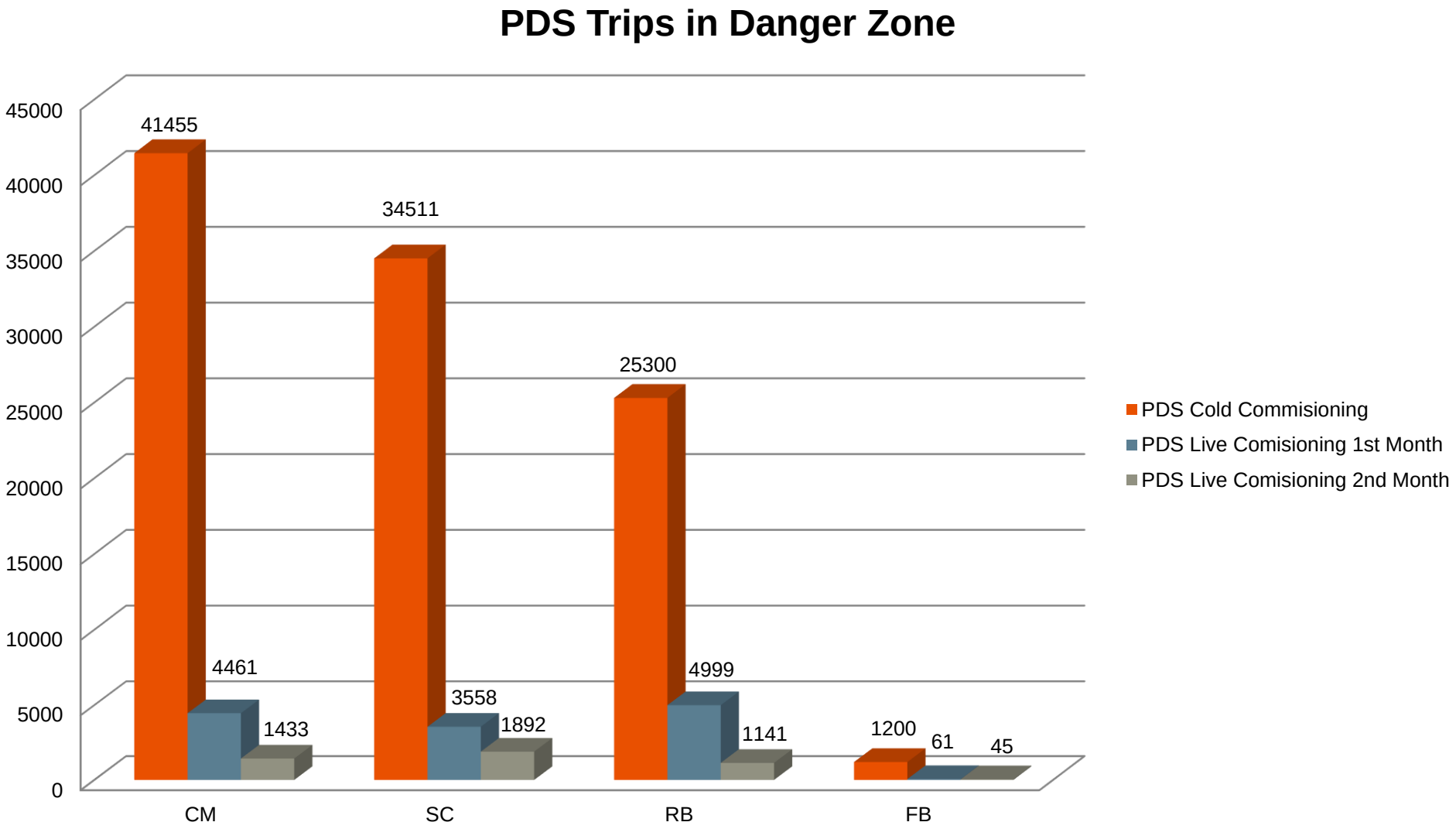


STRATA WORLDWIDE

Do refined static proximity detection systems change behavior?

STRATA
WORLDWIDE

Behaviour Results



Conclusions

Simplified, Static and Repeatable zones will:

- Enforce hazard zones
- Perform on multiple pieces of machinery in a mine wide environment
- Aid in training
- Not effect production
- Simplify inspections and field testing

STRATA WORLDWIDE

Where Safety is Success

STRATA WORLDWIDE