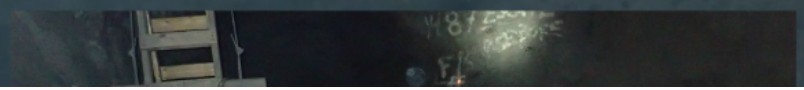

THE
PROBLEM
SMPTE
UNIVERSAL
LEADER
SAFESCAPE


SAFESCAPE
Practical Innovation
Modern Escapeway Solutions for Underground Coal Mining


THE STORY
THE PROBLEM
THE SOLUTION
• SAFESCAPE, WHO WE ARE?
• THE SAFESCAPE LADDERTUBE PRODUCT OVERVIEW
• THE EXISTING METHODOLOGY AND ITS LIMITATIONS
• THE PROBLEM STATEMENT
• COAL SAFESCAPE SYSTEM OVERVIEW
• MATERIAL INNOVATIONS
• CLIMB ASSIST

THE STORY

Prior to Safescape the standard types of escapeway ladders were timber and steel ladders in airleg rises or for longer lengths, modular steel caged ladders. There are a variety of designs on the market. These ladders work fine in some operations.



Prior to Safescape the standard types of escapeway ladders were timber and steel ladders in airleg rises or for longer lengths, modular steel caged ladders. There are a variety of designs on the market. These ladders work fine in some operations.

...The biggest problem with the systems we were using is that they are not specifically designed for underground mines and the conditions that go along with that

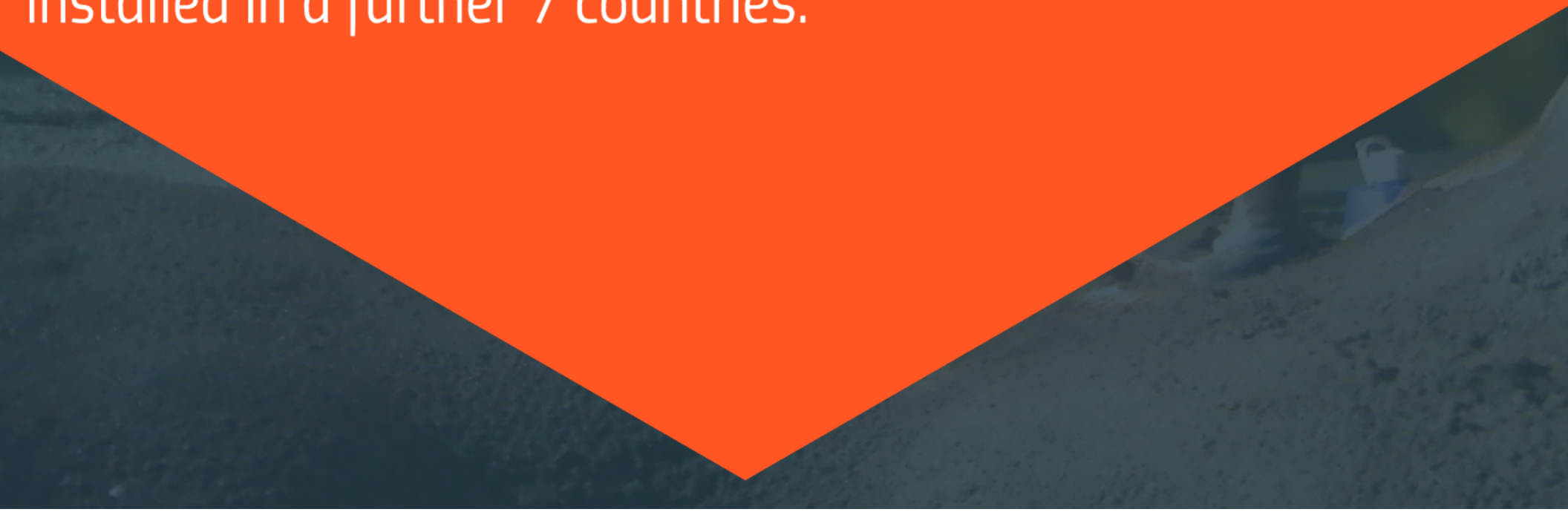
...The biggest problem with the systems we were using is that they are not specifically designed for underground mines and the conditions that go along with that environment.

In 2010 after 6 years of development the Safescape Laddertube was installed for the first time at the Fosterville Gold Mine.

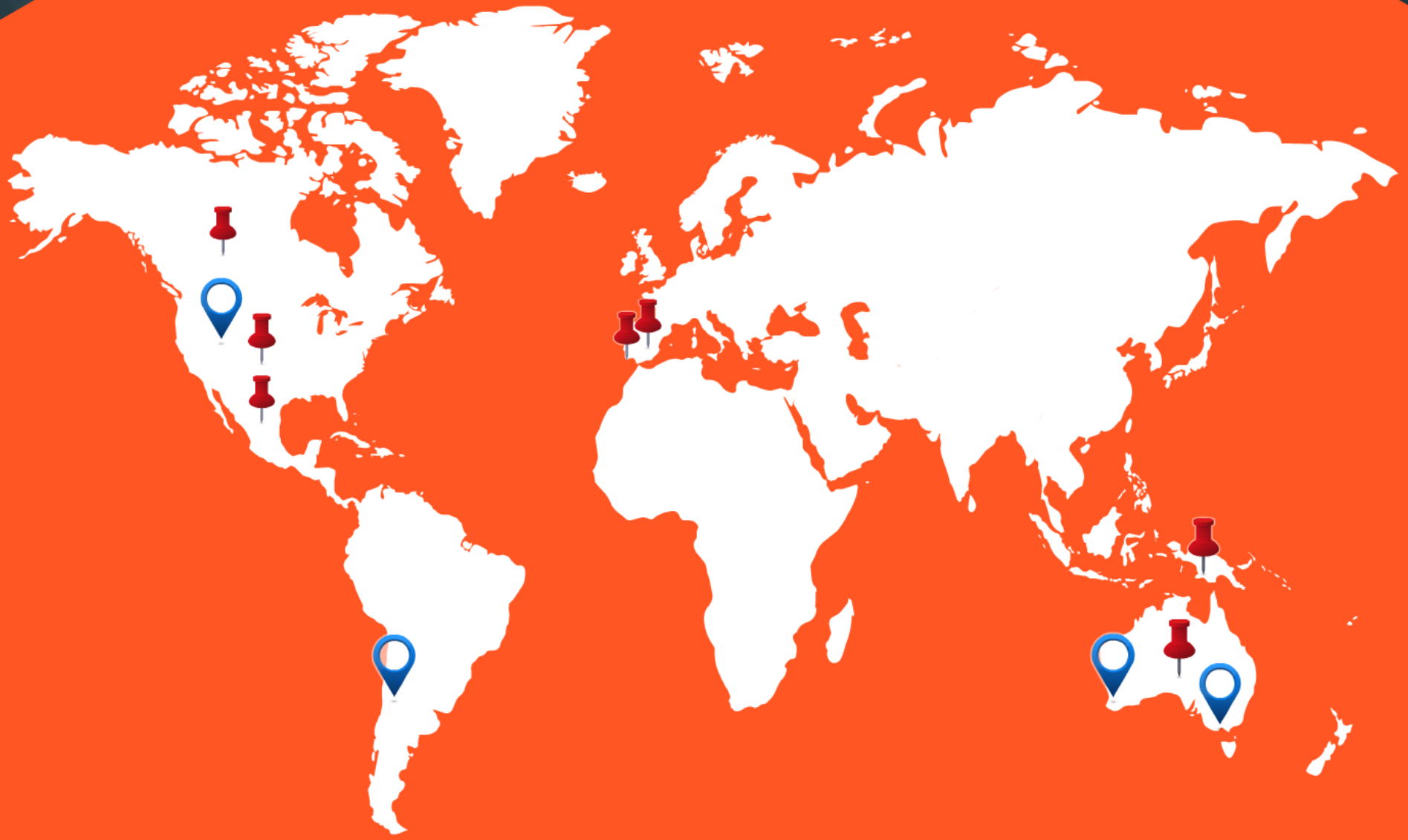
Today we have 4 offices in 3 countries

Today we have 4 offices in 3 countries

To date, we have installed over **12.5km** of Laddertube in 7 countries. Looking forward through 2015, we plan to have installed in a further 7 countries.



Today we have 4 offices in 3 countries

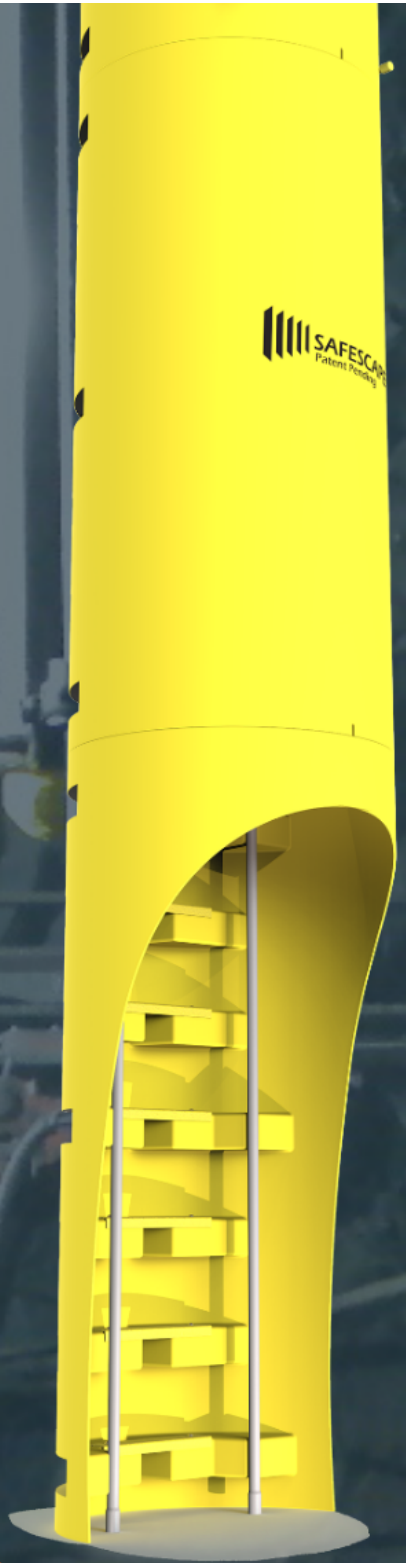


To date, we have installed over **12.5km** of Laddertube in 7 countries. Looking forward through 2015, we plan to have installed in a further 7 countries.

TECH SPEC

Outside diameter - 960mm
Module height - 2190mm
Step depth -150mm at edge
Step spacing - 300mm
Handrail diameter - 32mm
Working Load - (150kg rated) for each step or rest platform.
Anchor Bolt Rated Load - 1000kg

TAKE A LOOK

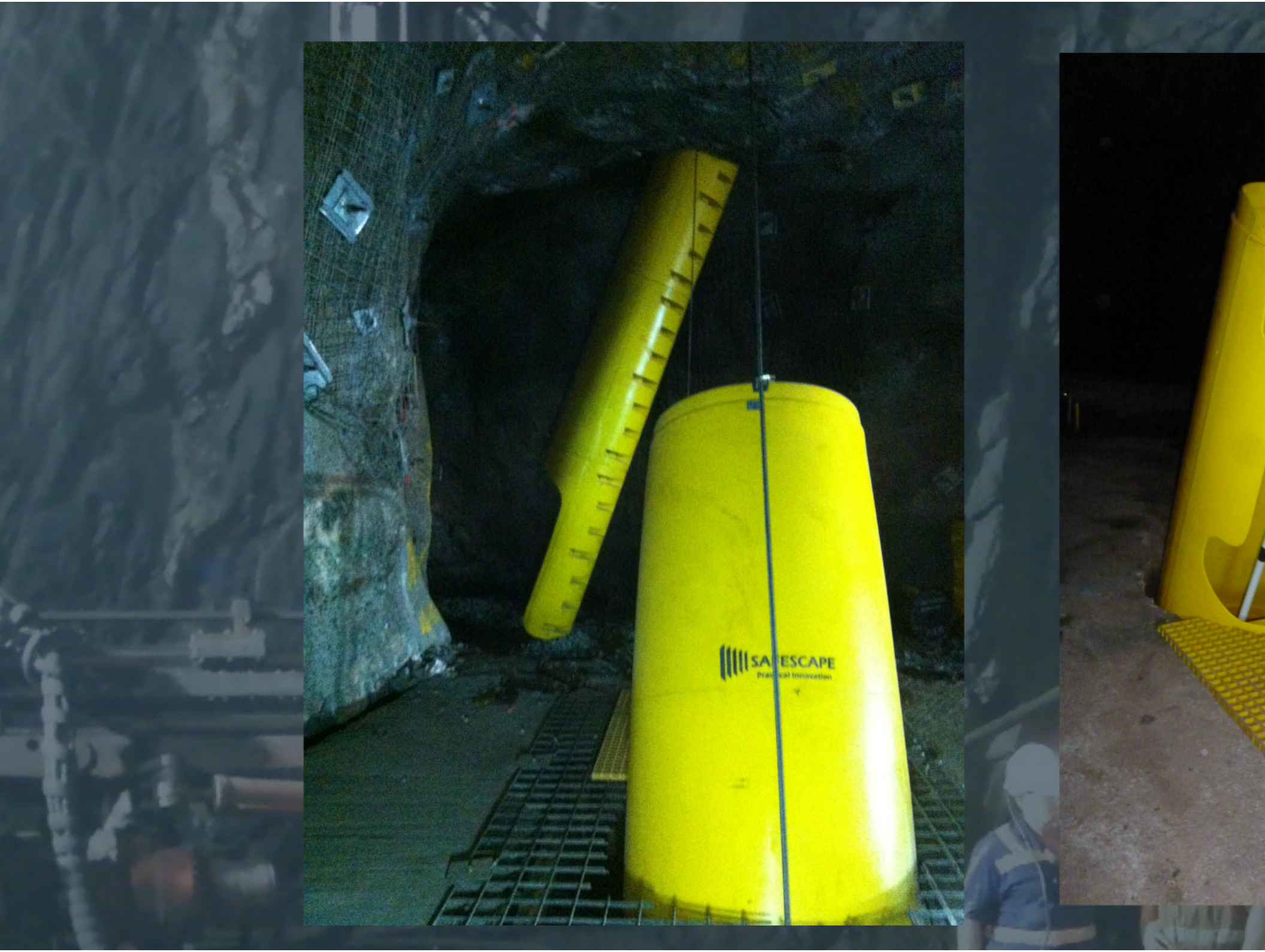


SPEC

Outside diameter - 960mm
Module height - 2190mm
Step depth -150mm at edge
Step spacing - 300mm
Handrail diameter - 32mm
Working Load - (150kg rated) for each step or rest platform.
Anchor Bolt Rated Load - 1000kg

TE
SP

Outside diam
Module heigh
Step depth - 1
Step spacing
Handrail diam
Working Load
step or rest p
Anchor Bolt R


SAFESCAPE


ESCAPE


SMPTE
UNIVERSAL
LEADER

THE PROBLEM

The existing methodology for coal mine escape involves the use of staged caches of oxygen generating re-breathers along the primary access route. This presents two challenges to safe emergency escape:

1. Given that the primary reasons for utilizing this methodology is outbreak of fire or explosion it is likely that the air will be hot and visibility will be low.

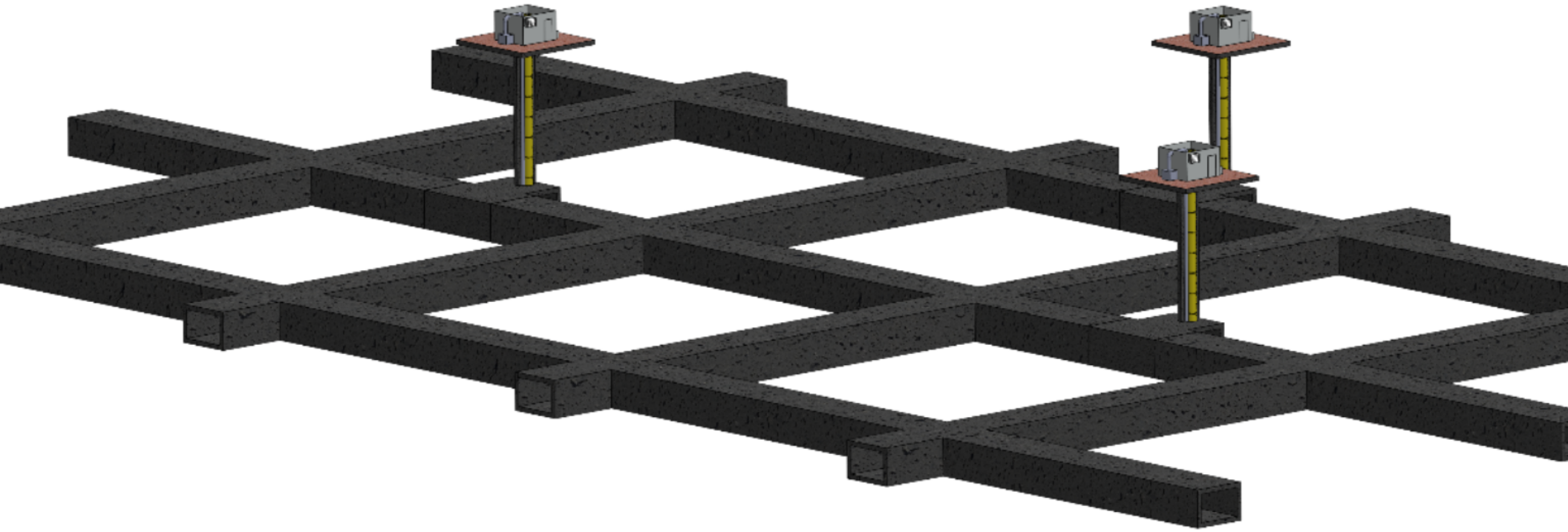
2. There is the risk of a secondary explosion occurring.

THE SOLUTION

THE SOLUTION

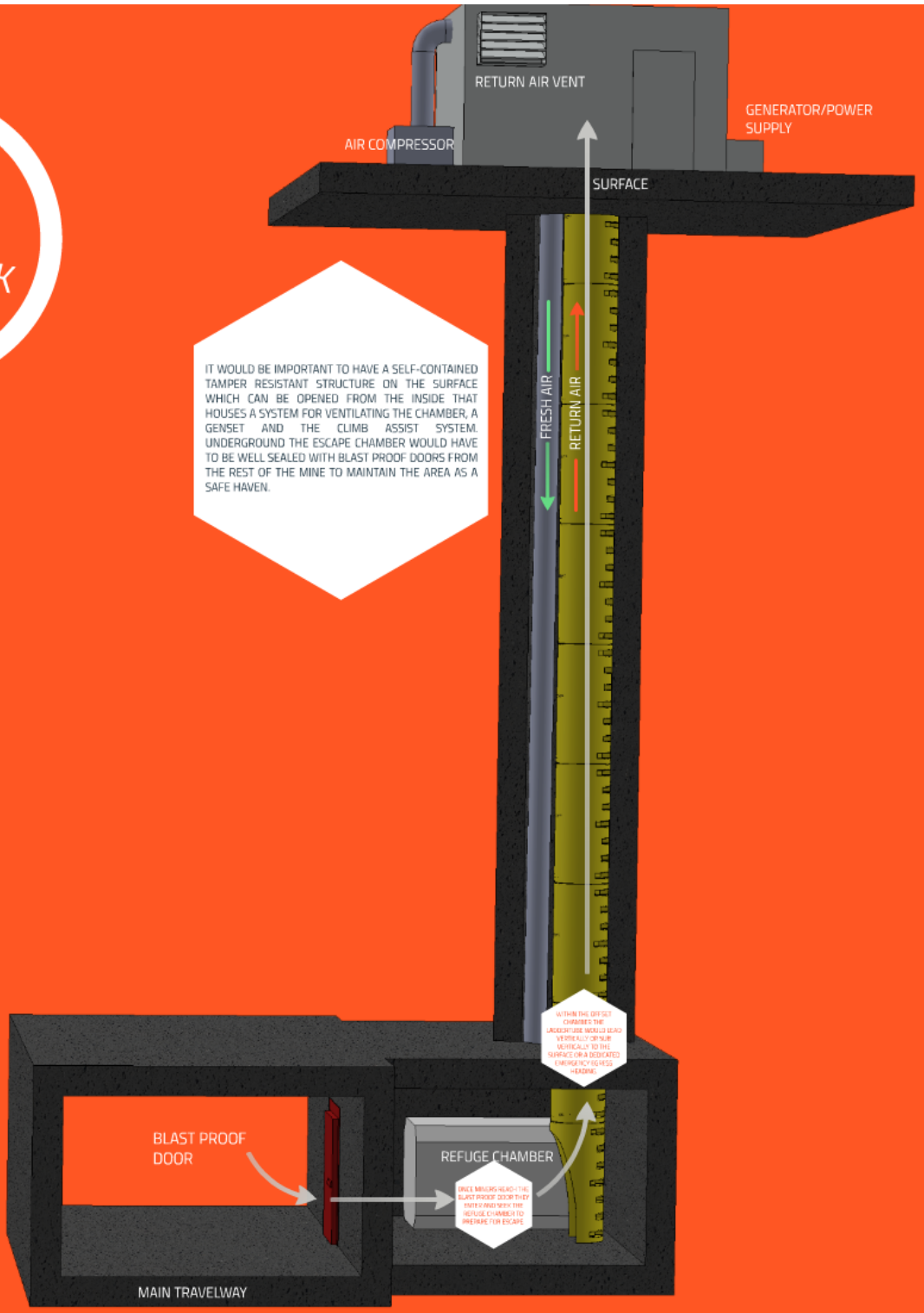
The application of existing coal methodologies for escape and metalliferous methodologies for refuge do not currently meet the needs of the future of underground coal mining around the world.

A solution to this may be achieved by putting the two systems together in a unique way that matches the inherent risks associated with underground coal mining, a new system can be generated which will be safer than anything we have had in the past.



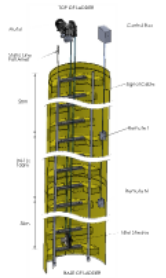
Provision of a chamber off the main travelway accessed through an explosion proof door, every 2-3km depending on a reasonable determination of the distance miners can travel under their self-contained oxygen generating rebreather.

LETS TAKE A CLOSER LOOK

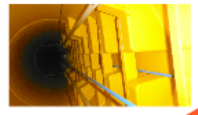


IT WOULD BE IMPORTANT TO HAVE A SELF-CONTAINED TAMPER RESISTANT STRUCTURE ON THE SURFACE WHICH CAN BE OPENED FROM THE INSIDE THAT HOUSES A SYSTEM FOR VENTILATING THE CHAMBER, A GENSET AND THE CLIMB ASSIST SYSTEM. UNDERGROUND THE ESCAPE CHAMBER WOULD HAVE TO BE WELL SEALED WITH BLAST PROOF DOORS FROM THE REST OF THE MINE TO MAINTAIN THE AREA AS A SAFE HAVEN.

INNOVATIONS
CLIMB ASSIST

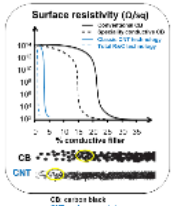


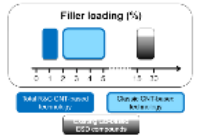
- Can effectively take up to 55kg of a climbers weight, drastically reducing fatigue and making it possible to install virtually any continuous length.
- We have successfully deployed this system in ladderways up to 400m in length.

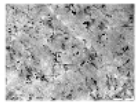


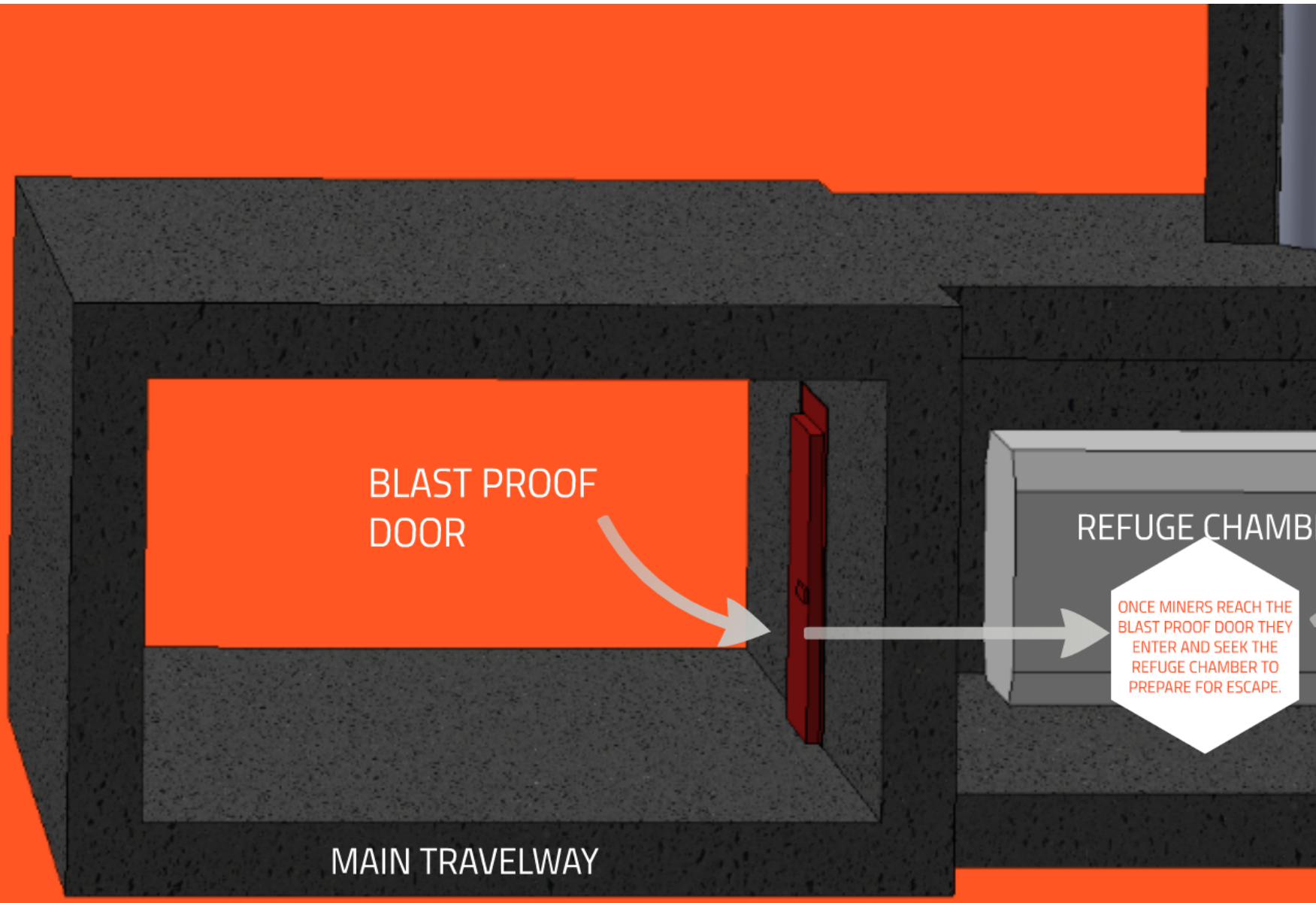
INNOVATIONS
MATERIAL

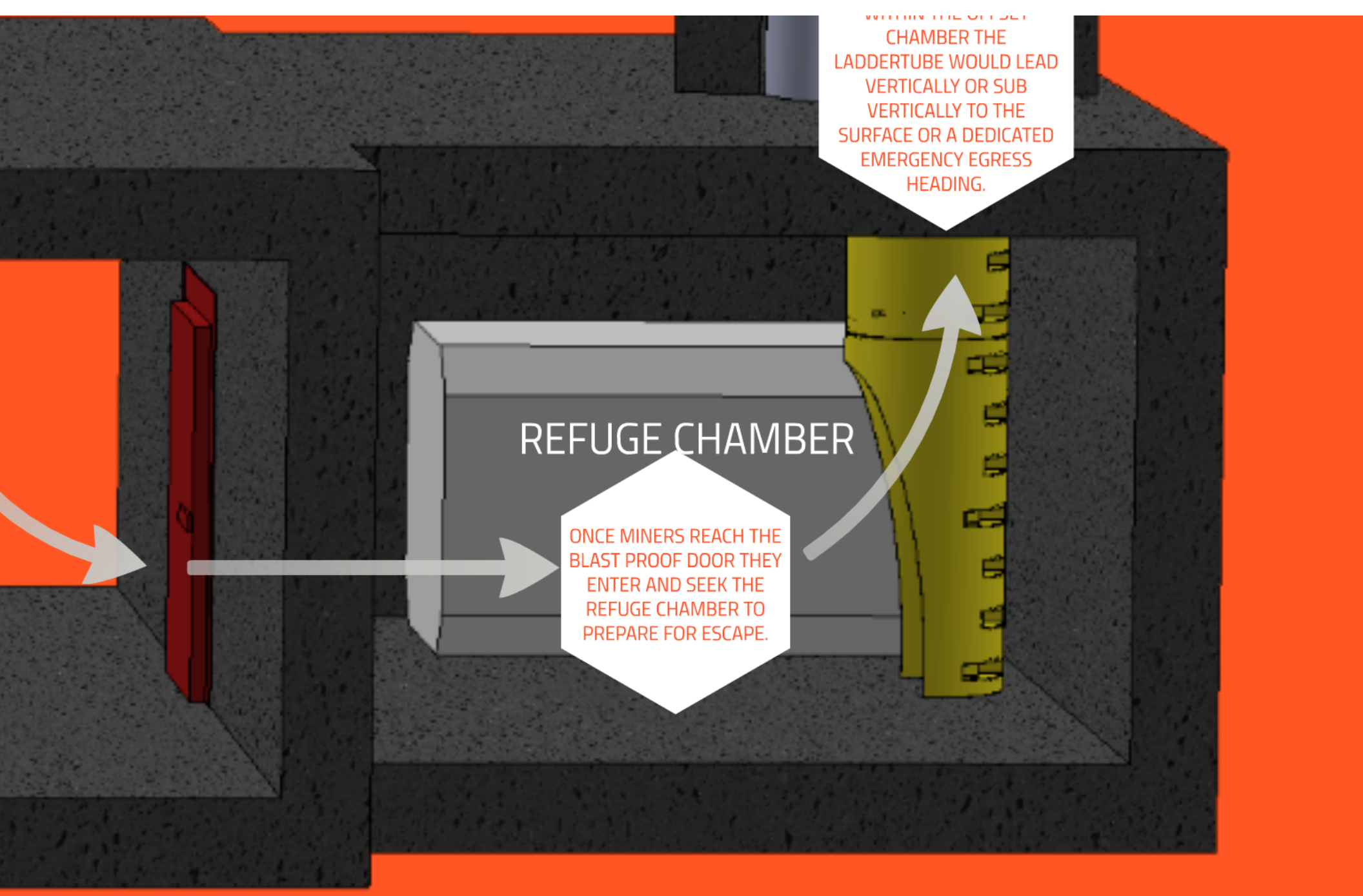
Standard polyethylene is not suitable for the coal environment due to its static insulative properties, we are in the process of utilising a carbon nanotube based polymer to over come this issue. This polymer will also demonstrate a degree of fire retardancy.

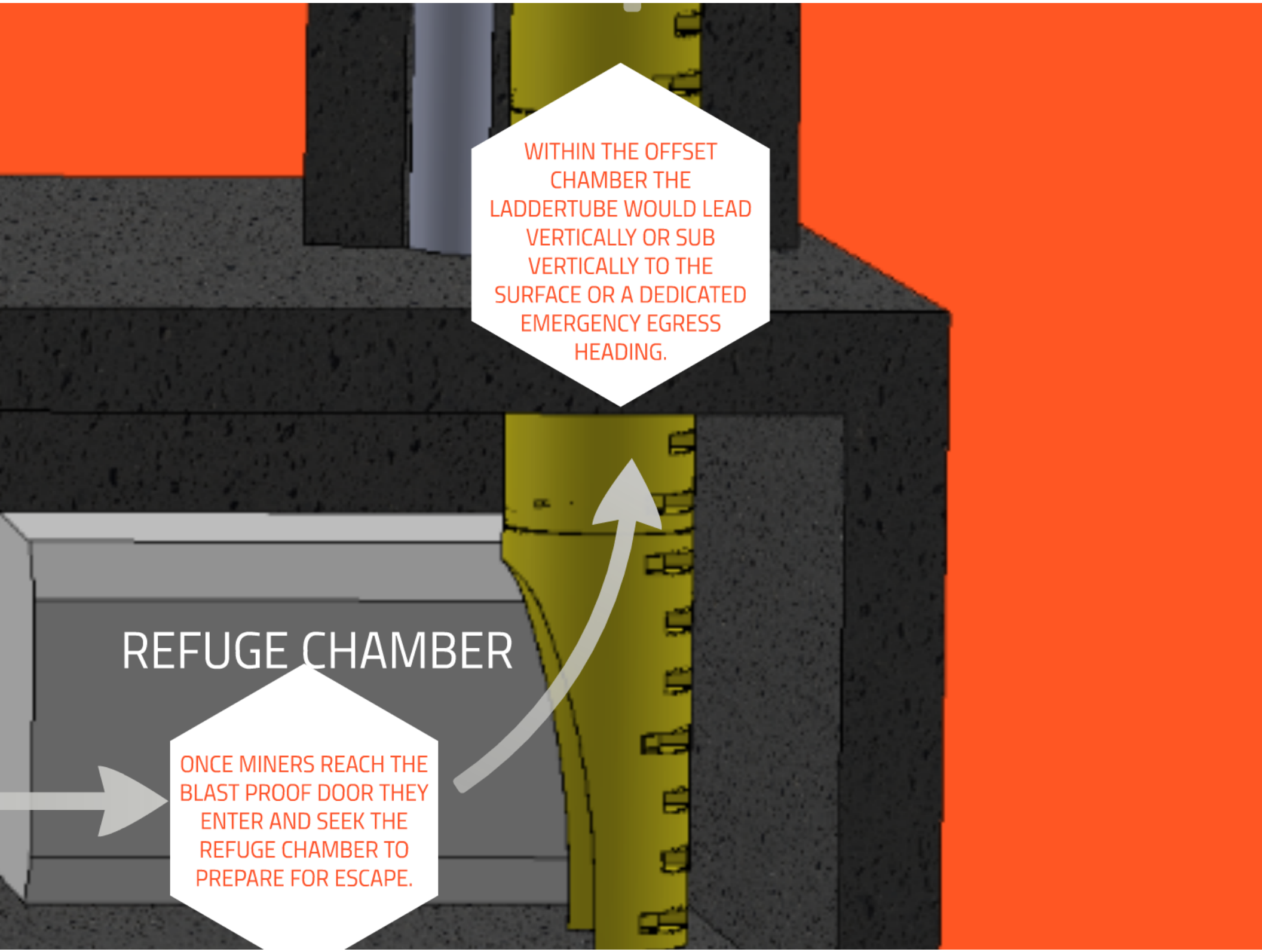


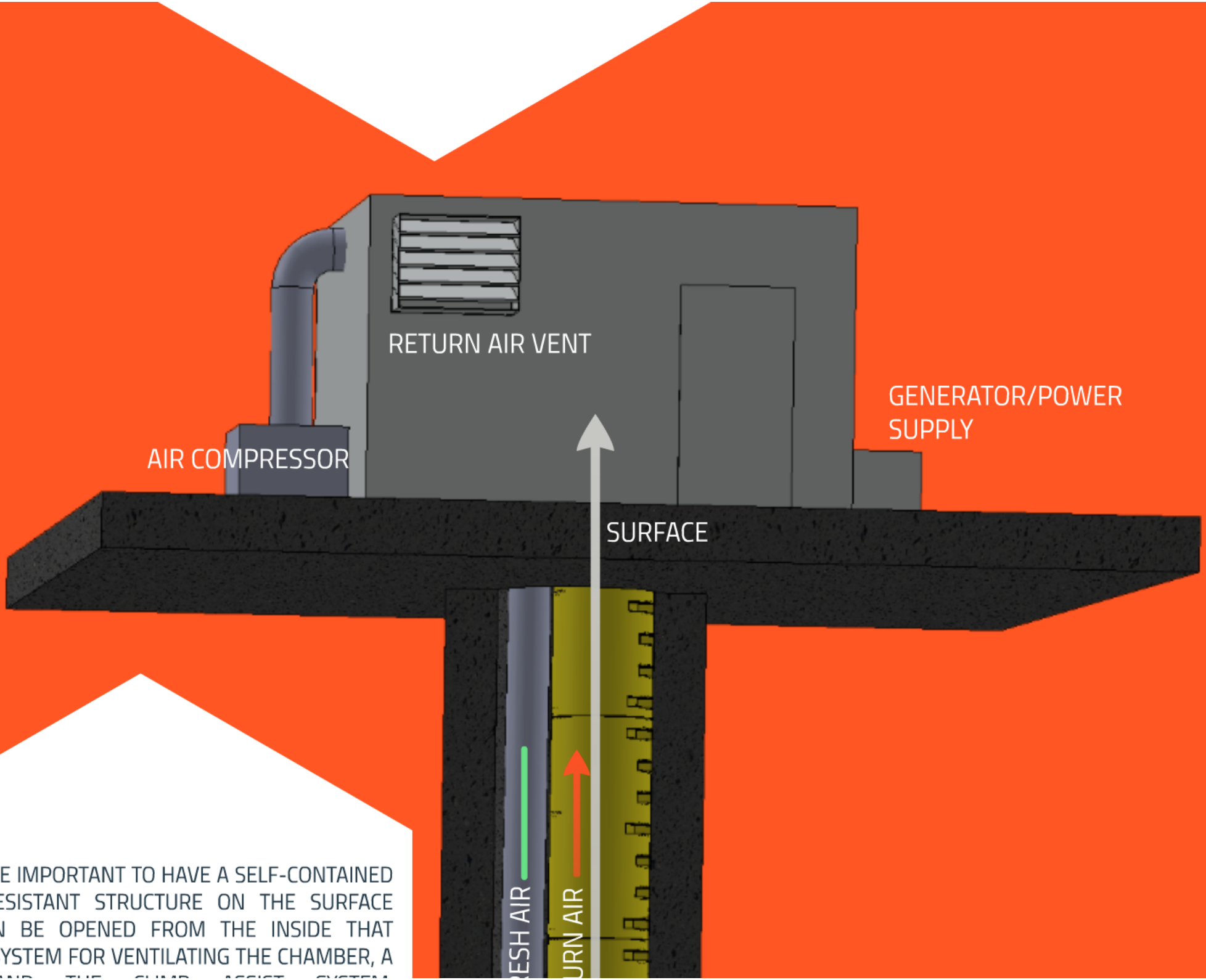




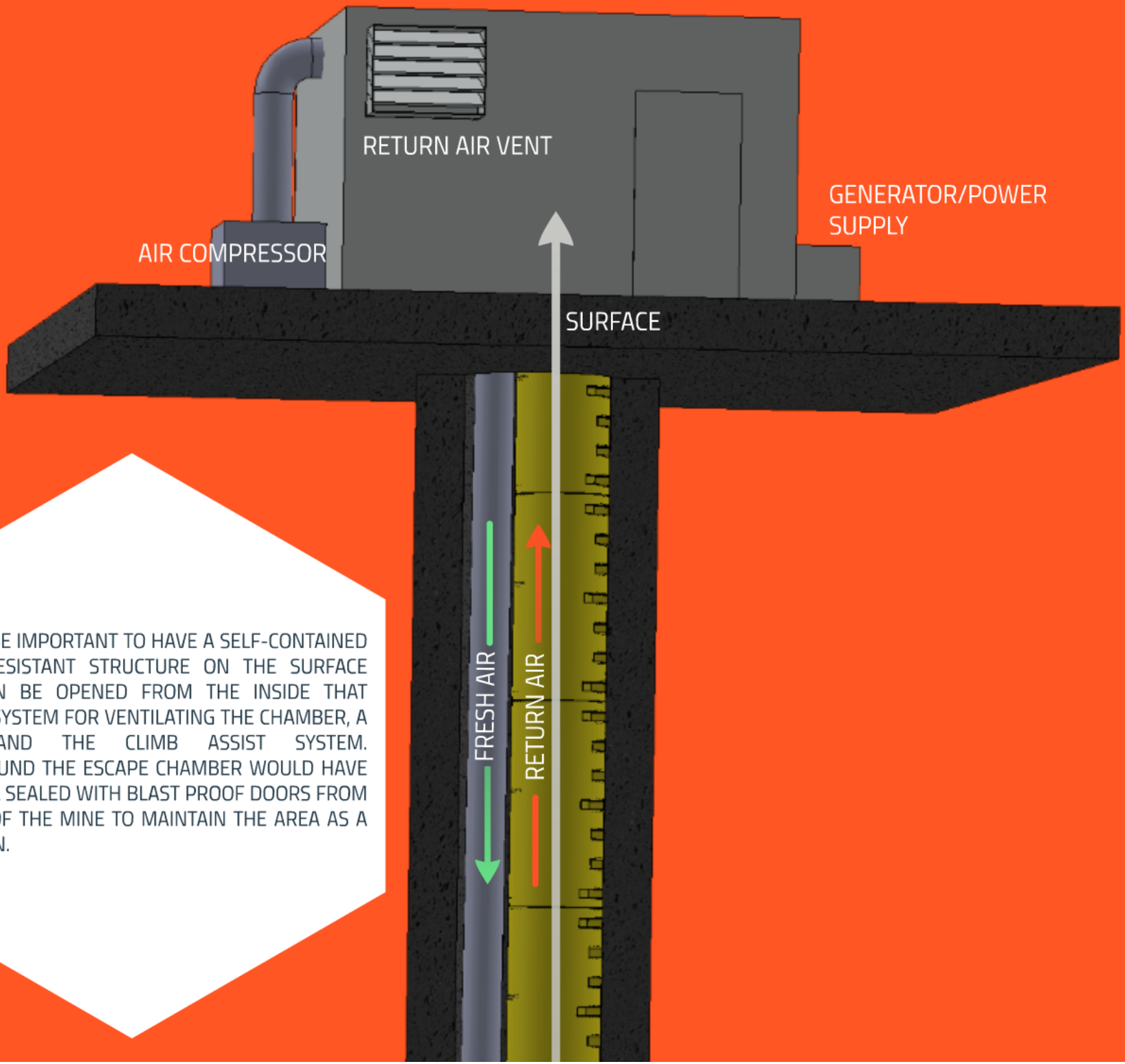

BLAST PROOF
DOOR
REFUGE CHAMB
ONCE MINERS REACH THE BLAST PROOF DOOR THEY ENTER AND SEEK THE REFUGE CHAMBER TO PREPARE FOR ESCAPE.
MAIN TRAVELWAY


CHAMBER THE
LADDERTUBE WOULD LEAD
VERTICALLY OR SUB
VERTICALLY TO THE
SURFACE OR A DEDICATED
EMERGENCY EGRESS
HEADING.
REFUGE CHAMBER
ONCE MINERS REACH THE
BLAST PROOF DOOR THEY
ENTER AND SEEK THE
REFUGE CHAMBER TO
PREPARE FOR ESCAPE.


WITHIN THE OFFSET CHAMBER THE LADDERTUBE WOULD LEAD VERTICALLY OR SUB VERTICALLY TO THE SURFACE OR A DEDICATED EMERGENCY EGRESS HEADING.
REFUGE CHAMBER
ONCE MINERS REACH THE BLAST PROOF DOOR THEY ENTER AND SEEK THE REFUGE CHAMBER TO PREPARE FOR ESCAPE.

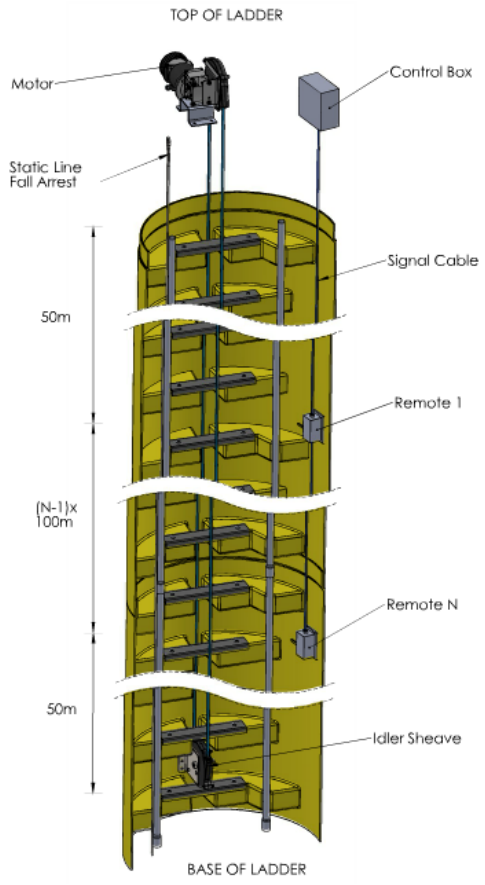


LD BE IMPORTANT TO HAVE A SELF-CONTAINED
R RESISTANT STRUCTURE ON THE SURFACE
CAN BE OPENED FROM THE INSIDE THAT
S A SYSTEM FOR VENTILATING THE CHAMBER, A

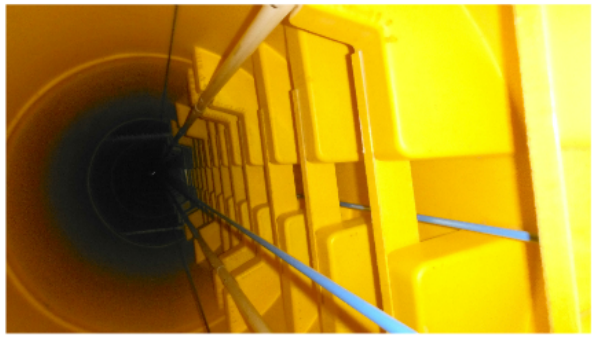


IT WOULD BE IMPORTANT TO HAVE A SELF-CONTAINED TAMPER RESISTANT STRUCTURE ON THE SURFACE WHICH CAN BE OPENED FROM THE INSIDE THAT HOUSES A SYSTEM FOR VENTILATING THE CHAMBER, A GENSET AND THE CLIMB ASSIST SYSTEM. UNDERGROUND THE ESCAPE CHAMBER WOULD HAVE TO BE WELL SEALED WITH BLAST PROOF DOORS FROM THE REST OF THE MINE TO MAINTAIN THE AREA AS A SAFE HAVEN.

INNOVATIONS
CLIMB ASSIST

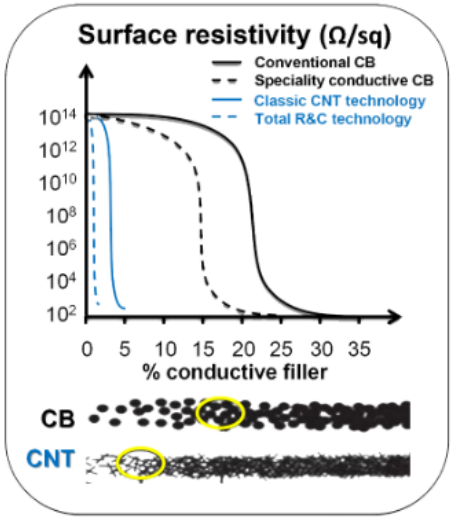


- Can effectively take up to 55kg of a climbers weight, drastically reducing fatigue and making it possible to install virtually any continuous length.
- We have successfully deployed this system in ladderways up to 400m in length.

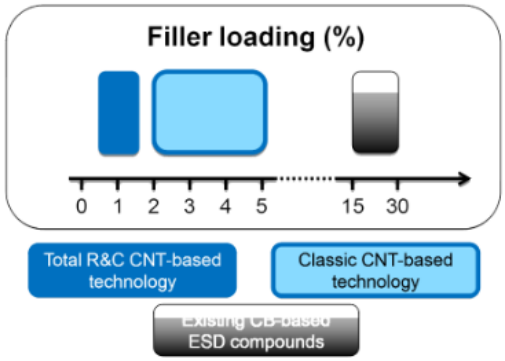


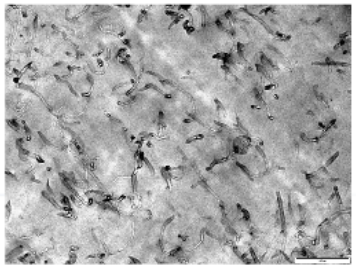
INNOVATIONS
MATERIAL

Standard polyethylene is not suitable for the coal environment due to its static insulative properties. we are in the process of utilising a carbon nanotube based polymer to over come this issue. This polymer will also demonstrate a degree of fire retardency.



CB: carbon black
CNT: carbon nanotubes



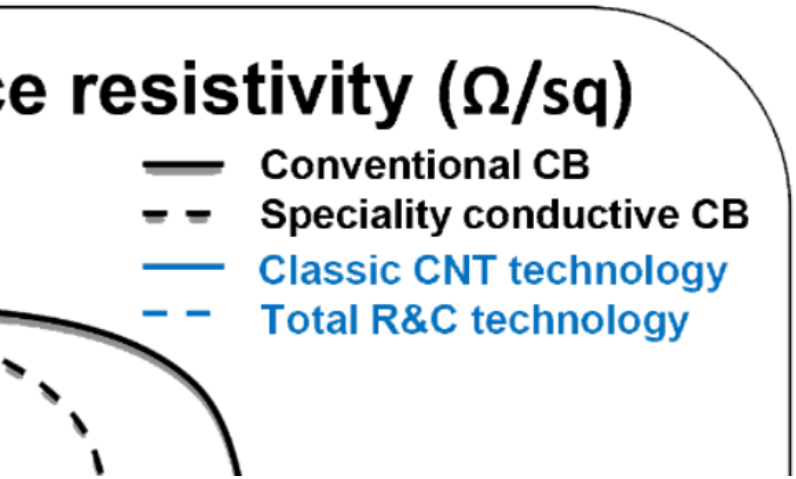


TOTAL

INNOVATIONS

MATERIAL

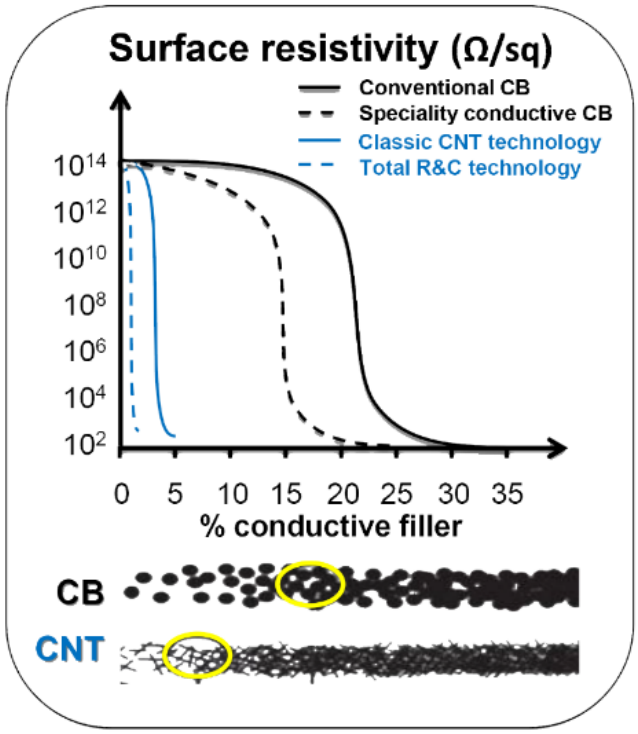
Standard polyethylene is not suitable for the coal environment due to its static insulative properties. we are in the process of utilising a carbon nanotube based polymer to over come this issue. This polymer will also demonstrate a degree of fire retardency.



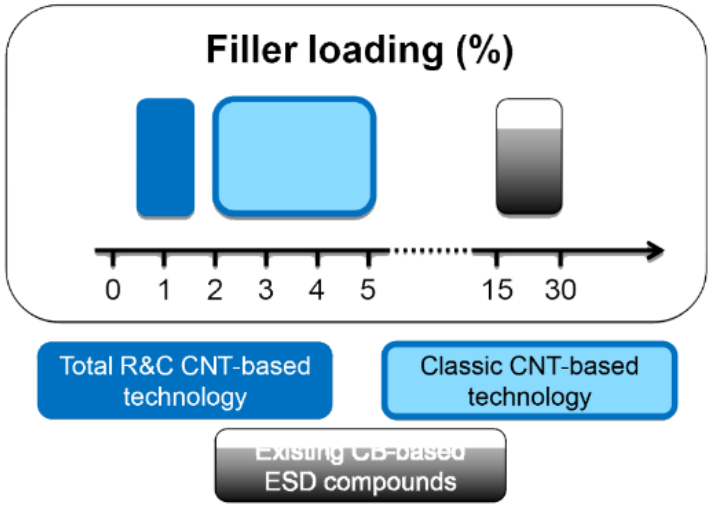
INNOVATIONS

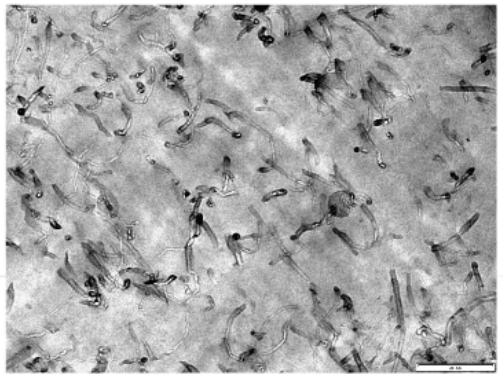
MATERIAL

Standard polyethylene is not suitable for the coal environment due to its static insulative properties. we are in the process of utilising a carbon nanotube based polymer to over come this issue. This polymer will also demonstrate a degree of fire retardency.



CB: carbon black
CNT: carbon nanotubes





TOTAL

TWO SYSTEM APPROACH

EXISTING ESCAPE SOLUTIONS

- WAY FINDING
- OXYGEN GENERATING RE-BREATHER

+

METALLIFEROUS METHODOLOGIES

- TEMPORARY REFUGE CHAMBERS
- RAPID ESCAPEWAYS

CONSIDERABLY REDUCED RISK FROM:

- FIRE TRAVELING THROUGH THE MINE
- EXHAUSTION AND ASPHYXIATION FROM TRAVELING THROUGH HOT SMOKEY AIR POTENTIALLY OVER A LONG DISTANCE
- SECONDARY EXPLOSIONS

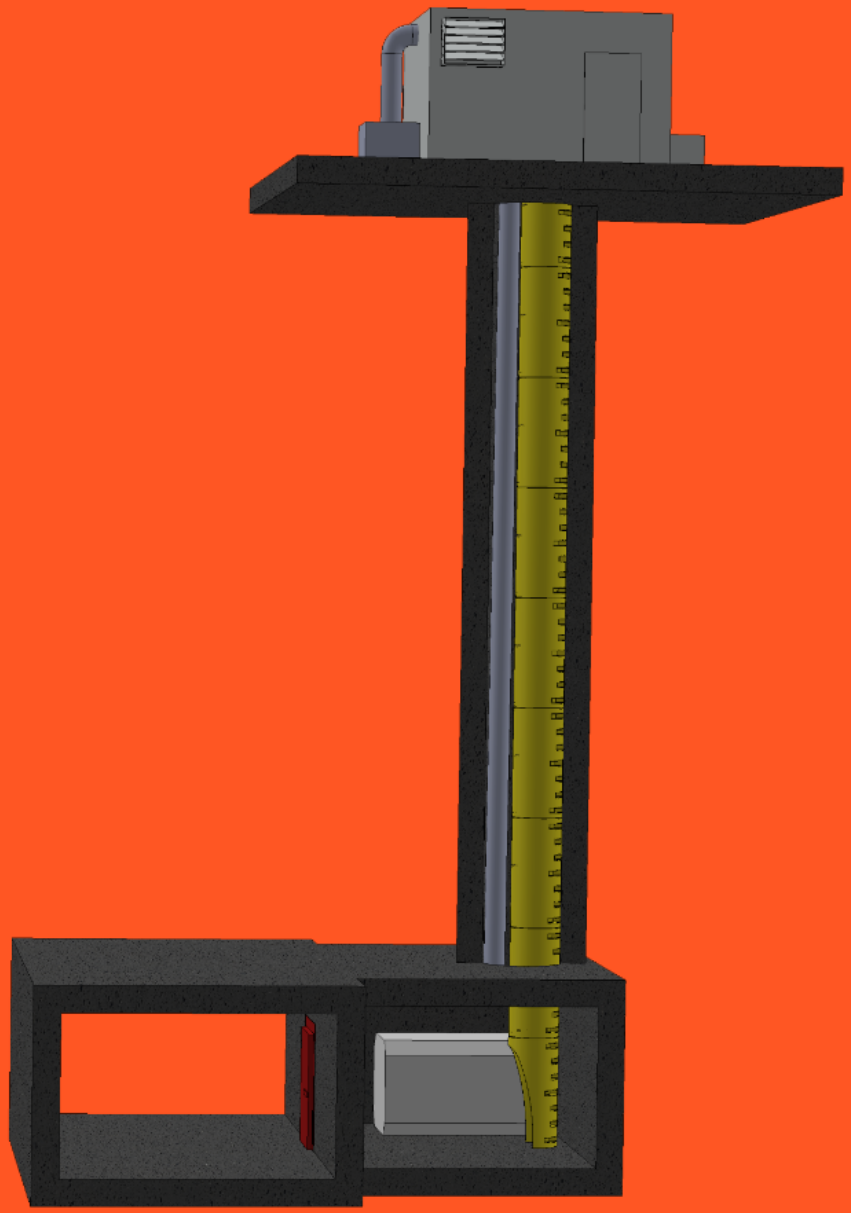
FINAL THOUGHTS

There is a lot of evidence in past disasters where personnel have survived the initial event only to die later due to asphyxiation, exposure to heat or secondary explosion.

It is possible to imagine that the results from similar disasters going from significant multi-fatality events down to single or zero fatality events using this new system.

While it does not stop the event from occurring it can reduce the impact and severity of the resulting emergency. Similar to having airbags in cars.

QUESTIONS?




SAFESCAPE
Practical Innovation
Modern Escapeway Solutions for Underground Coal Mining