SAMI Entry Examination and Making Safe Day of Learning

14 May 2021

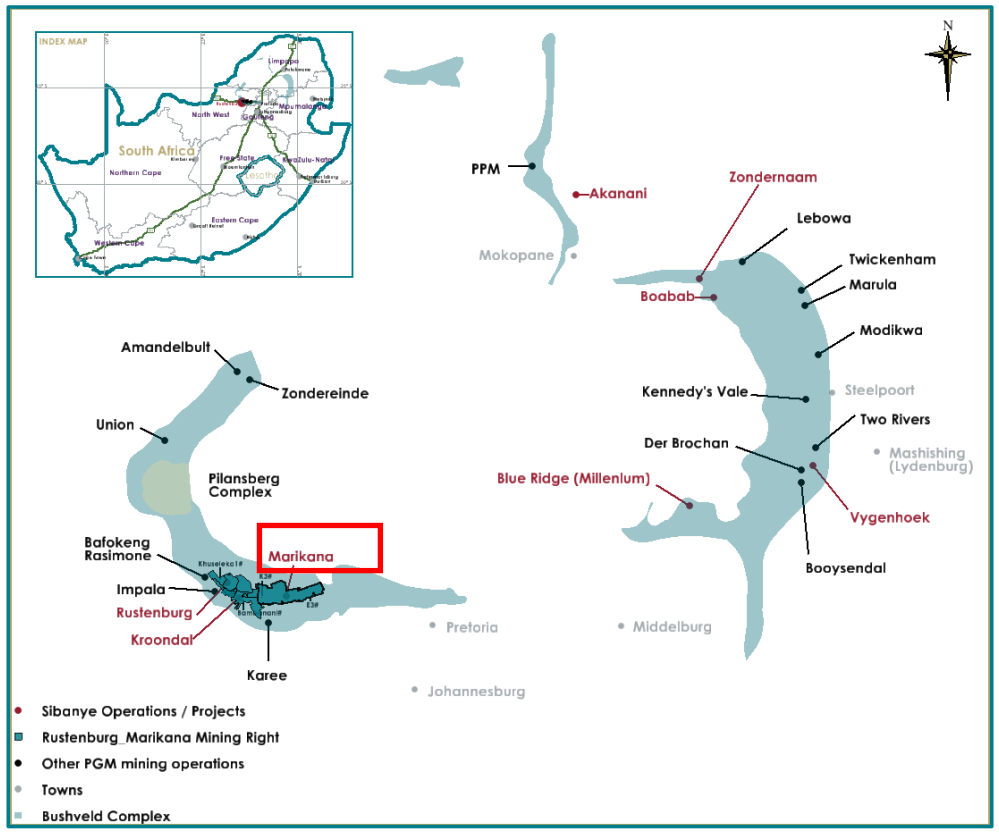
Abraham Chirindze-Mine Manager

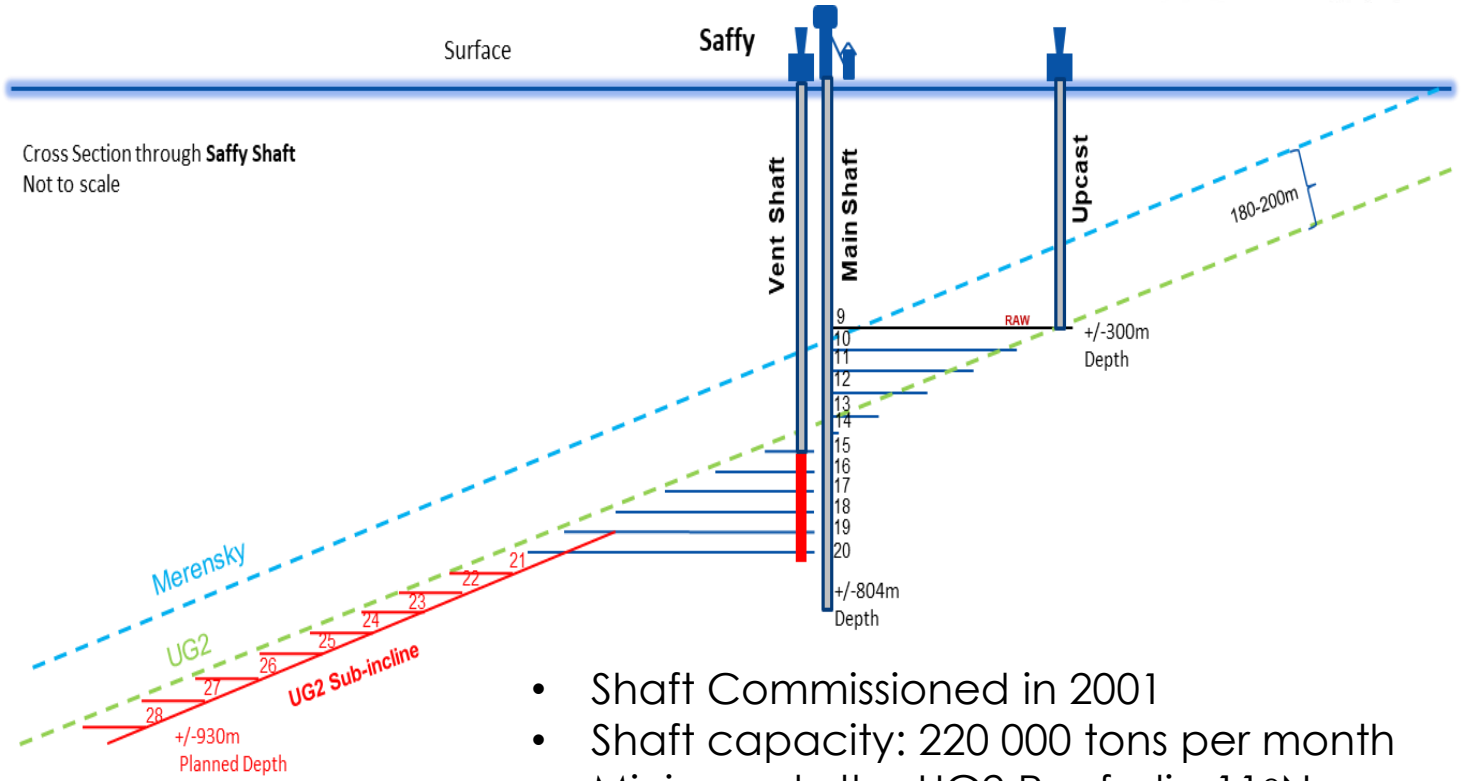
Sibanye Stillwater PGM Segment-Saffy Shaft

Overview

- Locality PGM Operations &Shaft Design & Infrastructure
- Shaft Design & Infrastructure
- Number of FOG incidents per year
- Activity during FOG incidents (injuries and non injuries)
- Activities that resulted in injuries
- FOG related accident & Learnings
- Initiatives

Locality PGM Operations & Shaft Design & Infrastructure





- Shaft Commissioned in 2001
- Shaft capacity: 220 000 tons per month
- Mining only the UG2 Reef, dip 11°N
- Presently on Conventional Mining method (2005 – 2009 Mechanized Mining)
- 70% breast and 30% dip layout
- 4E Grade 4.10 g/t
- Total Labour: 4108

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Sibanye-Stillwater Lifestyle

Our vision and values dictate our actions

PURPOSE

Our mining improves lives

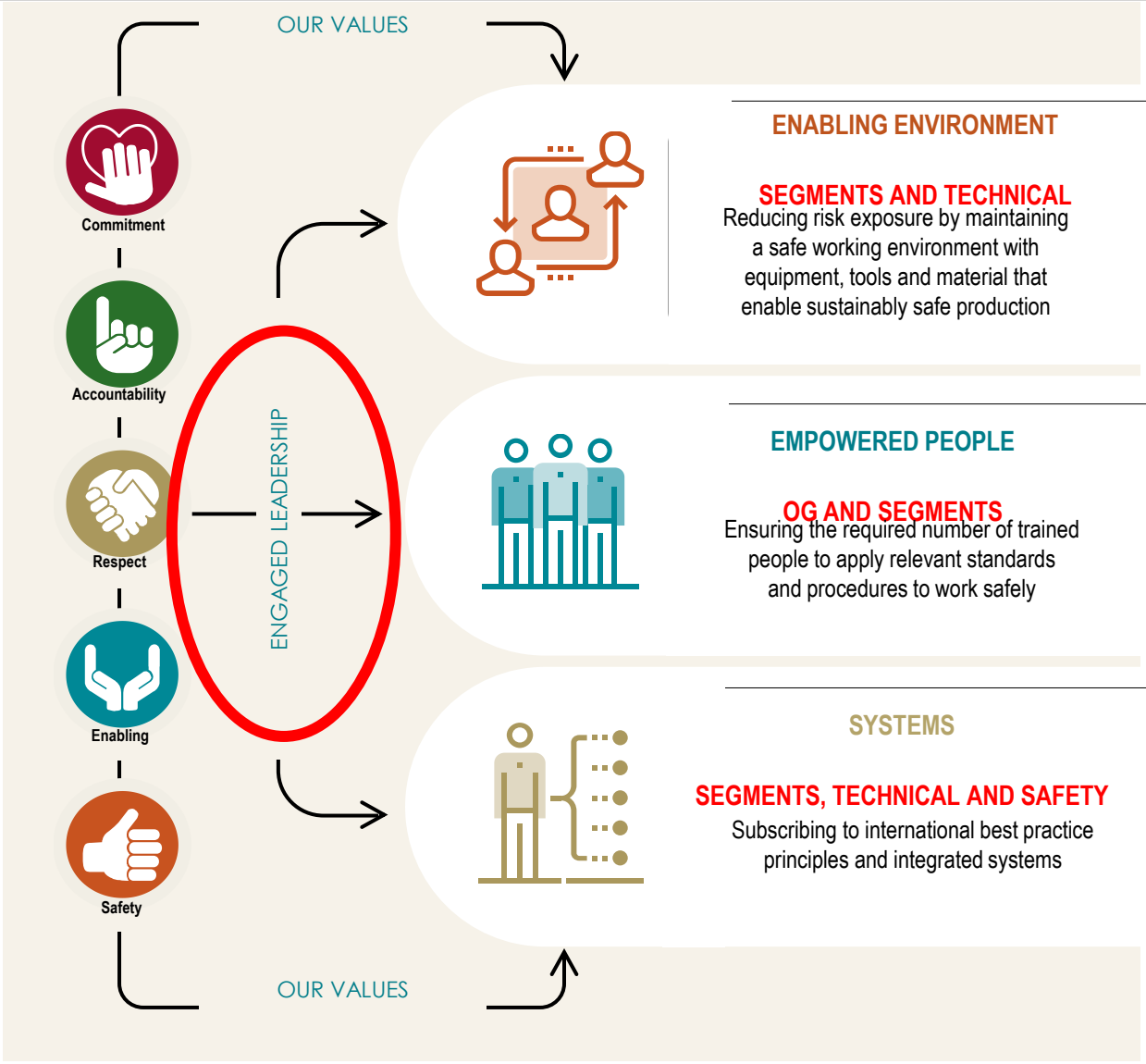
Underpinned by our
C.A.R.E.S. VALUES

VISION

SUPERIOR VALUE CREATION
FOR ALL OUR STAKEHOLDERS
through the responsible mining and beneficiation of our mineral resources

Ensuring value creation for all stakeholders is a fundamental requirement for sustainability

Zero Harm Strategic Framework



ENABLING ENVIRONMENT

SEGMENTS AND TECHNICAL

Reducing risk exposure by maintaining a safe working environment with equipment, tools and material that enable sustainably safe production

- Real risk reduction initiatives ongoing
  - Working place layout improvements
  - Ventilation and refrigeration
    - Occupational Hygiene, dust, noise, radiation, DPM
  - Infrastructure improvement
  - Shafts; Horizontal transportation, In stope ore removal, Fires
  - Surface water course safety
  - Focus on the 'elimination' of 'A' Hazards

EMPOWERED PEOPLE

OG AND SEGMENTS

Ensuring the required number of trained people to apply relevant standards and procedures to work safely

- Working and living with COVID-19
- Safe Production leadership and culture
  - Individual, team and organisation; Mirror sessions; Values-based decisions intervention
- Safety Summits
- High Impact training
  - Supervisory training
  - Language Policy
  - Risk management; Strata control, Incident investigations
- Section 23 withdrawals reinforcement
- Risk Management capacitation and qualifications

SYSTEMS

SEGMENTS, TECHNICAL AND SAFETY

Subscribing to international best practice principles and integrated systems

- Mine Operating System enhancement
- Risk management
  - Integration with the Mine Operating System
  - Risk identification, prioritisation, reduction , follow up
  - Bow-tie risk management; critical controls
  - Root cause analysis
  - Real Risk Reduction Protocols
  - Life-saving rules
  - Trigger Action Response Plan (TARP)
- Safety and Health leading indicators
  - QlikView rollout
- TRIFR
  - Low energy incident focus
  - Incident reviews
  - Basic cause analysis
- Rock mass management
- Independent high potential incident reviews
  - Action plans per segment
- ICMM principles
  - Definitions
- ISO 45001 Occupational Health & Safety certification (2021)
- Safety maturity management (Bradley curve)
- Incentive Scheme alignment
  - Fatal penalty 2022
  - Leading indicators inclusion 2022
  - Health indicators 2023

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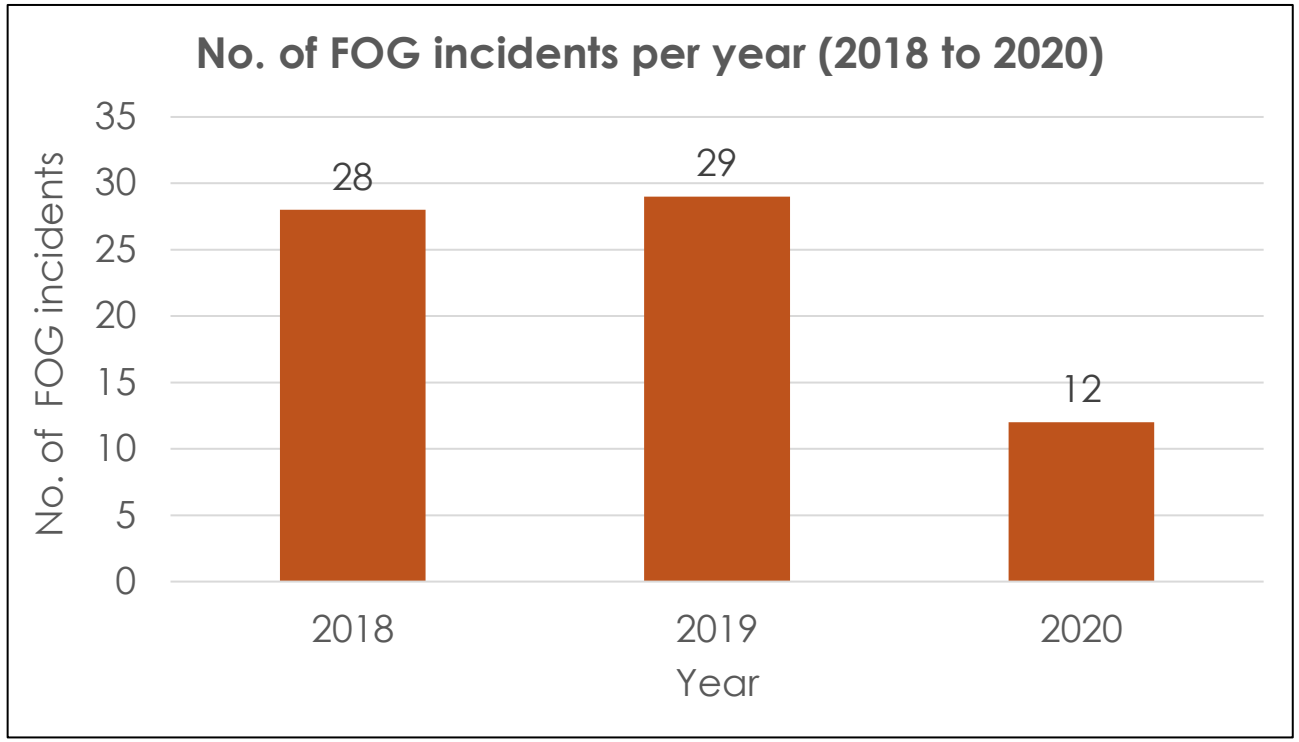
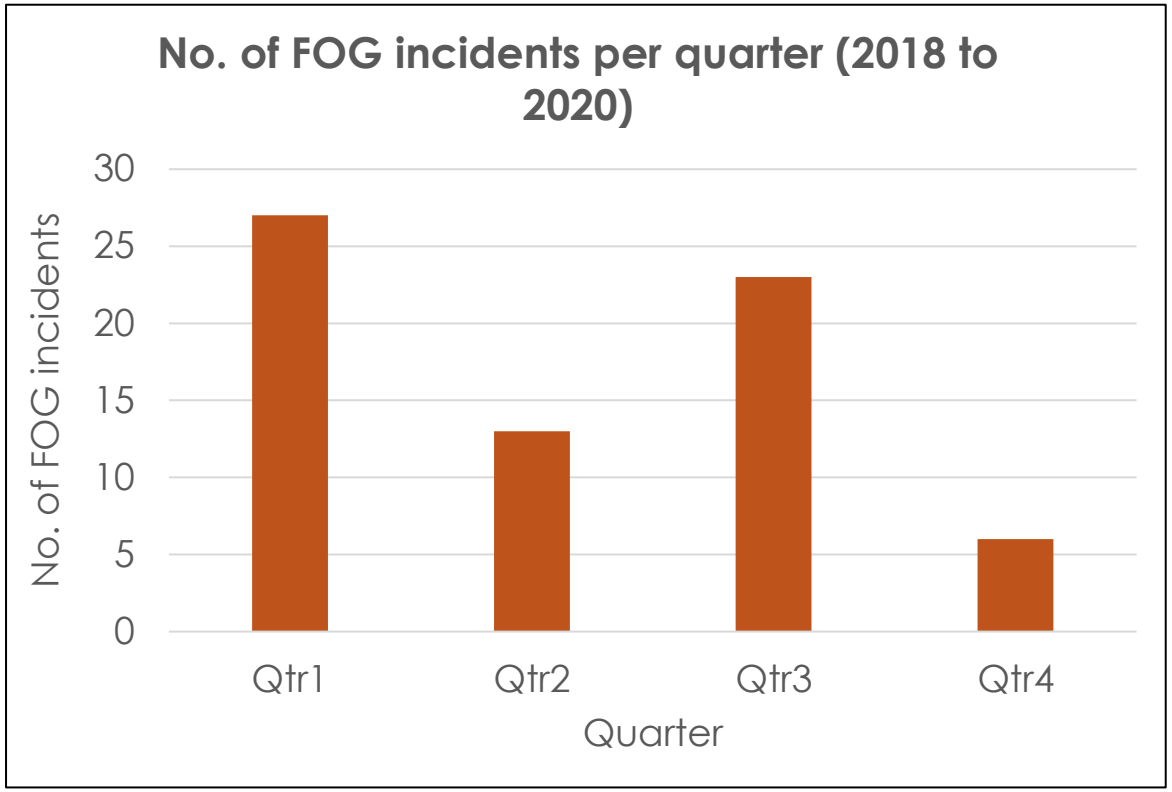
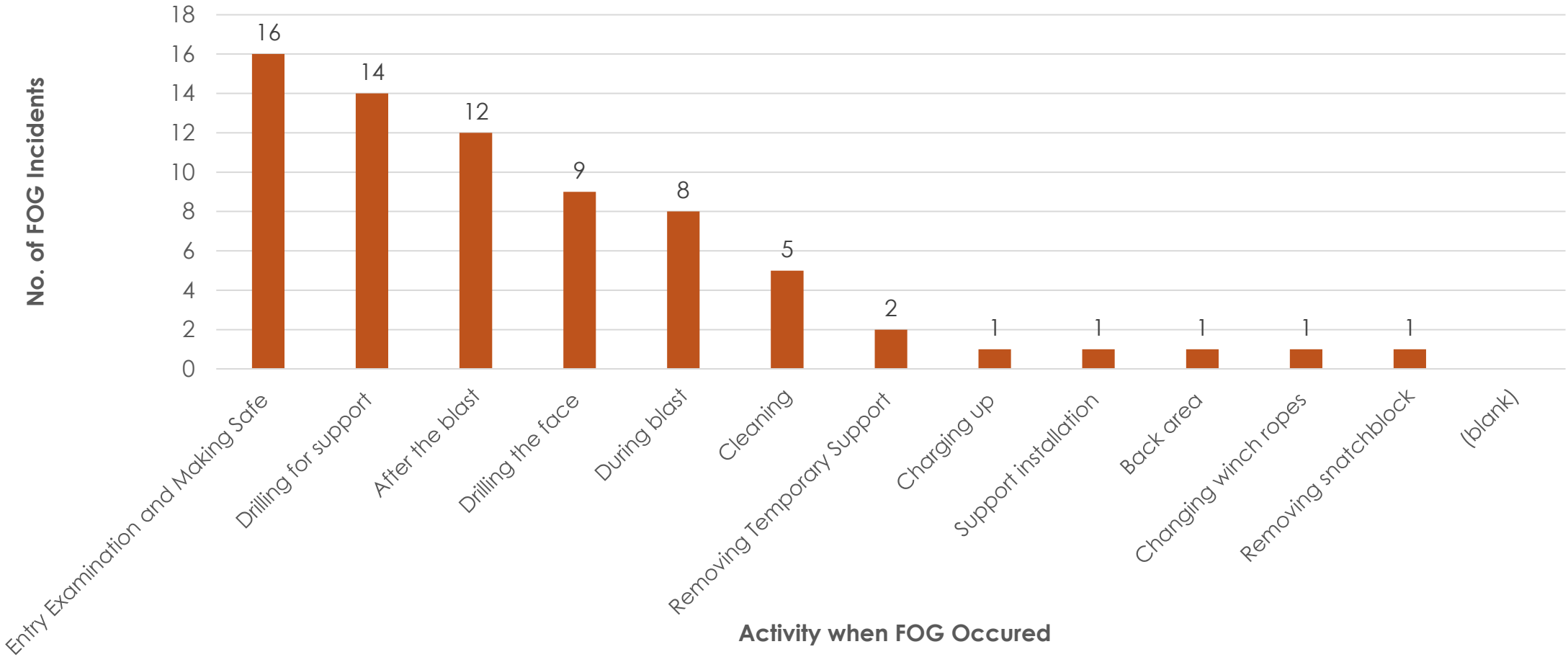
FOG Stats

Number of FOG incidents per year

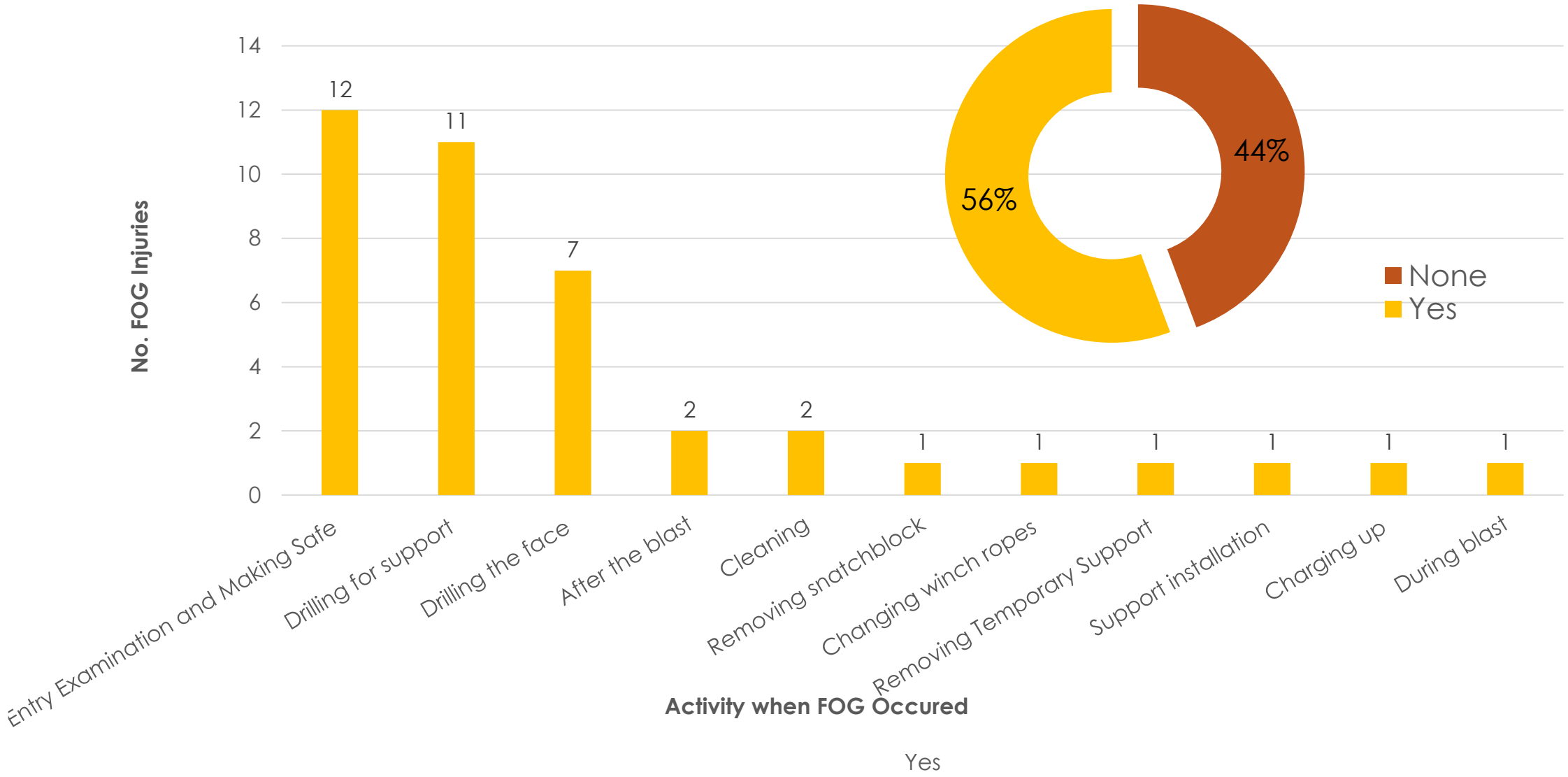




Activities during FOG incidents (injuries and non injuries)



Activities that resulted in injuries



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FOG Injury / Sample case study

Saffy Shaft Past FOG Related Injury

Name:	Mr M.Sezelwa
Occupation	Team Leader
Time	08:30
Working Place	14E 56 ASG 02E
Injury	Open wound left thigh

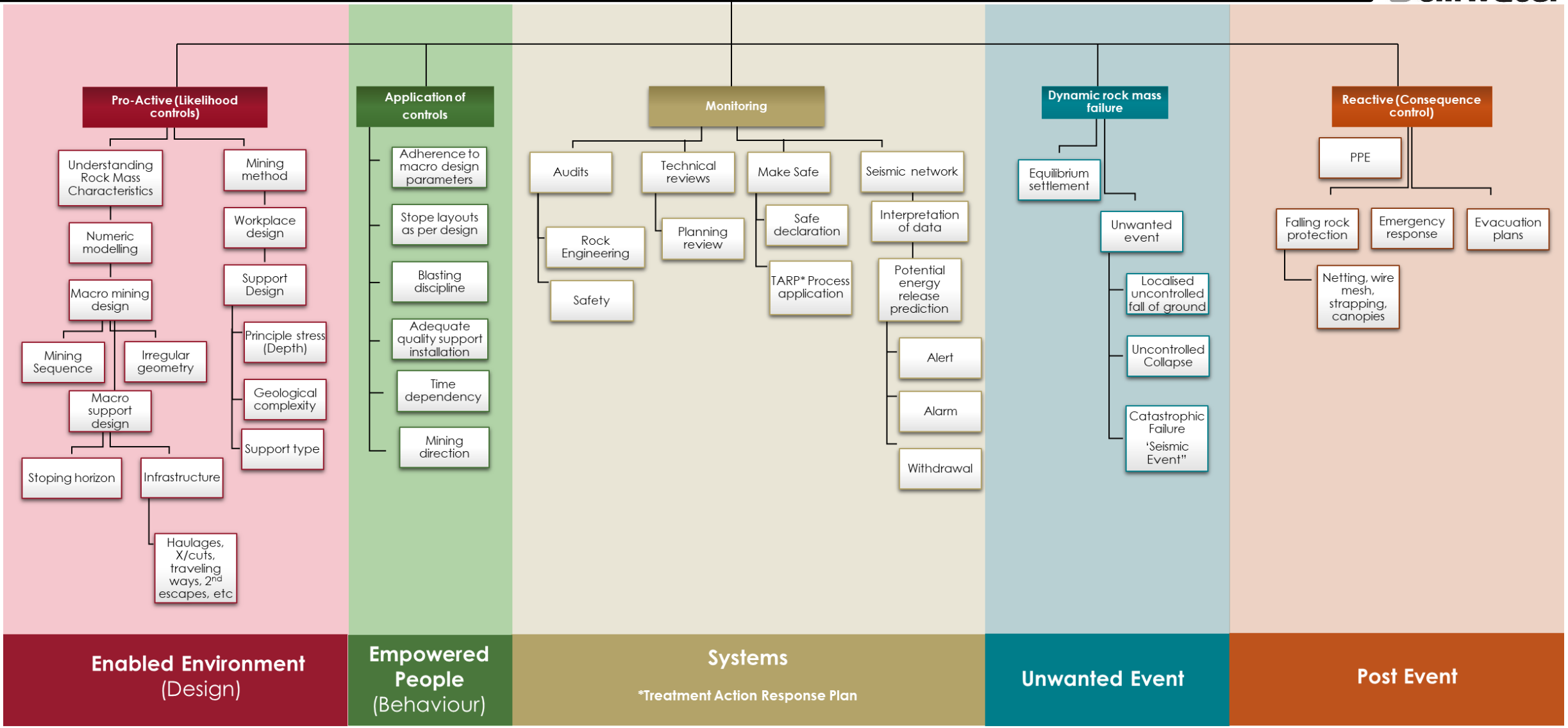
Whilst the now injured was walking towards the rig chain to remove the scraper rope from the snatch block in the ASG,a rock (0,6m x 0,25m x 0,10m) dislodged from the sidewall of the ASG and struck him on his left thigh.

Procedural non-compliance - Early Entry Examination
- Safe Declaration
- Identification and Demarcation of Geological Features
- Over Inspection by supervisors

Causation

System Failures	Job Factors and Personal Factors	Unsafe Acts and Conditions	Absent or Failed Defences
• Failure to adhere to early entry examination procedure. • Failure to comply with TARP process.	**Personal Factors** • Did not bar sidewall to solid during entry exam. • Poor hazard. identification-geological features not identified • Hastiness to re-clean the panel for blast.	**Unsafe Acts:** • Not following the safe declaration and making safe procedure.	• Failure to comply with Standard and procedure on early entry exam and making safe. • Failure to ensure adequate barring is done on sidewall. • Failure to overinspect
	Job factors: • Not established	**Unsafe condition:** • Low angle joints observed during investigation. • Scaling of sidewalls of ASG observed.	

Rock Mass Management



Key Learnings & Actions

- Team leader and crew must conduct proper early entry and examination and sign off the safe declaration book.
- Shift supervisors and miners must frequently over inspect their work places and coach employees .
- Safety representatives must be empowered to exercise their duties in the work place in particular section 23.
- Service departments and management to follow up of T2 & T3 work places and give guidance.
- Engaged leadership - Management and service departments must on weekly basis conduct VFLs on “hot spot” areas and follow up on previous workplaces with high risk ratings.
- Management to close-out on leading indicators of the week based on safety and rock engineering reports.
- Escalate Red Risks, T3 and stop notes to Mine Managers and VP
- Escalate repeat deviations to management and VP

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Real Risk Reduction

Marikana Operations – Safety Parthenon Model - 2021

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Vision:
"Send all employees home health and safely"

Mission:
A workforce that accepts ownership for health and safety at work and at home for a sustainable future

Belief: ZERO HARM STRATEGIC FRAME WORK – "Safe Production is Possible"

OUR VALUES

- Commitment
- Accountability
- Respect
- Enabling
- Safety

ENABLING ENVIRONMENT

ENGAGED LEADERSHIP

EMPOWERED PEOPLE

FIT-FOR-PURPOSE SYSTEMS

OUR VALUES

Risk \ Safety Management	Rock mass Management	RBE	People \ Health	Engineering Solutions	Standards
SAFETY, HEALTH AND ENVIROMENT					
• Objective, Focus Areas and Targets • Syncromine Roll out • ISO 45001	• TARP • Canopy Jacks • Resin Bolt • Remote Drilling • Blast on Mesh • Safety nets Dev	• Braking Systems • Caboose/ guard cars • PDS's • Loco Controllers • Becons • STOP Functionality	• Behavior observations • Critical behaviors per occupation • Safety officers Analysis • Leading indicators • Training S/Reps • Safe Culture intervention • Wellness Campaigns	• No Pea valve • Spinning adaptors • Metatarsal boots • Trakka Key management • Flexible pinchbars • Re railing device	• MCOP's • COPS • Standard revisions • PTO's • MOC

SHE policies, standards, procedures, systems and reporting that support business

2021 Safety Action Plan Model

Starting point for 2021

OUR VISION
Superior value creation for all stakeholders through mining our multi-commodity resources in a safe and healthy environment

OUR VALUES
COMMITMENT ACCOUNTABILITY RESPECT ENABLING SAFETY

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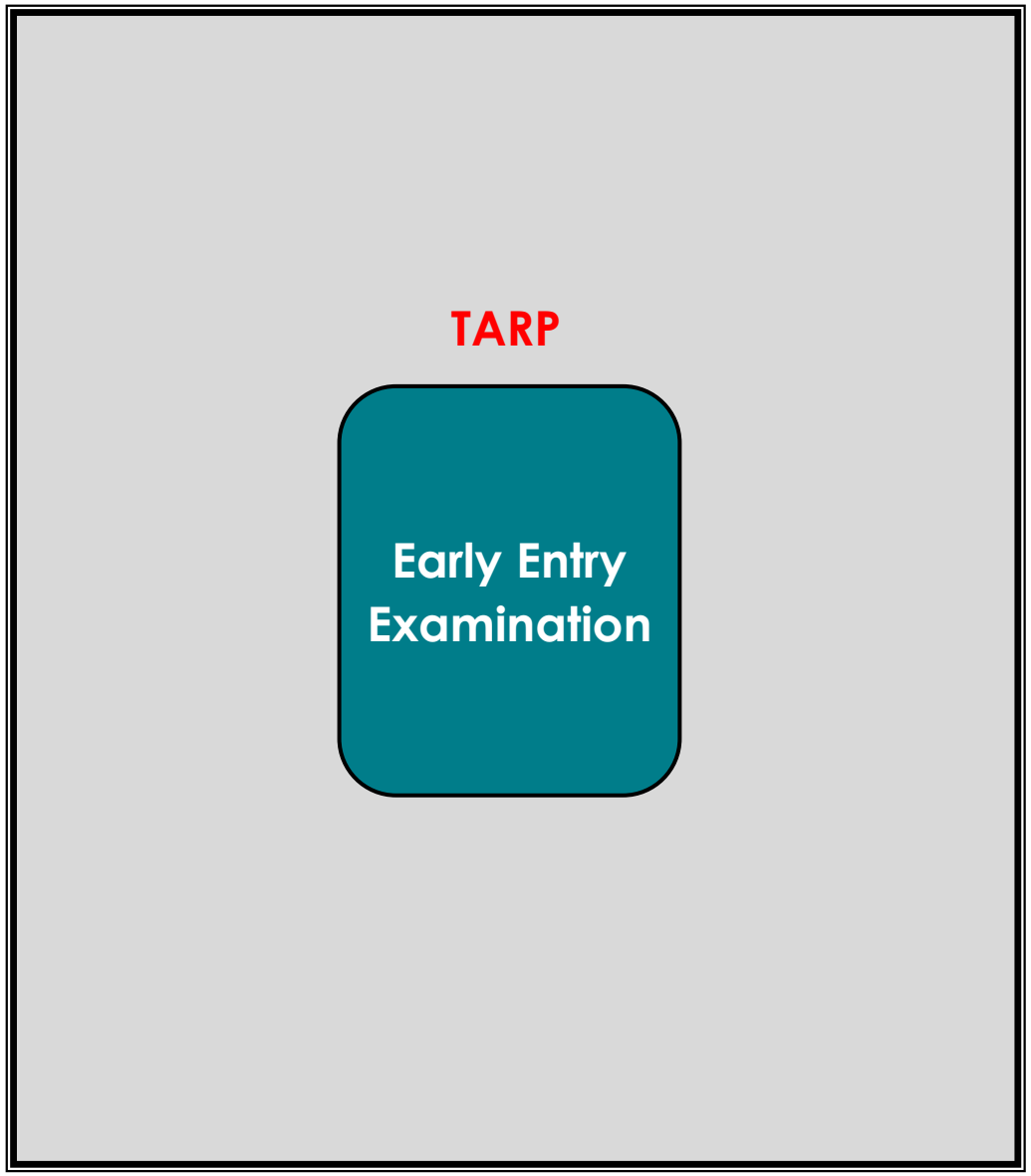
Entry Examination Procedure


TARP
Early Entry Examination

The Procedure

		Activity	Responsible
1	Waiting Place	All workers to report to waiting place. Conduct Waiting place procedure. Check compliance availability of required P.P.E Scrutinise "**Communication Book"** for Hazards and Risks identified during previous shift.	Competent (A) Person
2	Waiting Place	Select Examination Crew to perform Entry Examination. Whole crew to enter. Allocate duties as required to safeguard the area In the event of Competent A Person not arriving at schedule time the crew must remain at the waiting place.	Competent(A) Person / Miner
3	Travelling Way	On route to the stope, the Competent (A) Person must visually examine the travelling (bar solid /support if required.) Test ventilation flow, temperature and presence of harmful gasses in travelling way. If measurements are not within acceptable levels, rectify and continue or inform Miner and return to waiting place.	Competent(A) Person/ Miner
4	Winch Chambers	Visually examine the winch area and bar solid if required. Winch Driver must complete his Pre-use checklist and record all findings and report / fix all substandard items.	Competent(A) Person / Winch Driver
5	Centre Gully/ASG	Water down gully in area affected by the blast. Visually examine the gully and bar solid if required. Replace/barricade area if support in centre gully is missing or damaged.	Competent(A) Person / Miner
6	Centre Gully/ASG	Conduct test for ventilation flow, temperature and presence of harmful gasses. Should the measurements not be within acceptable levels rectify continue or inform Miner and return to waiting place.	Competent (A) Person/ Miner
7	Holings	Inspect all holings in blasted area and take necessary precautions/actions to safeguard the area.	Competent (A) Person / Miner
8	Examination of the panel	Water down area affected by the blast. Select a safe passage between permanent support to enter the panel Risk assess area for safe passage to enter panel. Starting at the tight end of the panel - Install temporary support as per support standard, identify any geological anomalies (mark additional support if required), bar face area solid .Test ventilation flow, temperature and presence of harmful gasses in panel. Should the measurements not be within acceptable levels rectify and continue or inform Miner and return to waiting place. Check for misfires- mark and point out. Examine sweeping areas and replace missing support	Competent (A) Person / Miner
9	Replace/Install support	Replace damaged / missing support before the blast. Install support and bar the area solid that were barricaded off during "Examination process".	Competent (A) Person / Miner
11	Record/Report	Enter in "**Safe Declaration Book"** any unsafe conditions for Responsible Miner's attention. The Miner must counter-sign the "**Safe Declaration Book"** after all the unsafe conditions reported has been rectified. All crew members must sign off on the safe declaration before continuing with the day's work.	Competent (A) Person / Miner, Team
12	Declare	Declare the workplace safe or follow TARP escalation process.	Competent(A) Person / Miner

All crew members involved

ACCURATE TARP Classification

Full compliance audits

Supervision follow-up

Safety rep and employee involvement / empowerment

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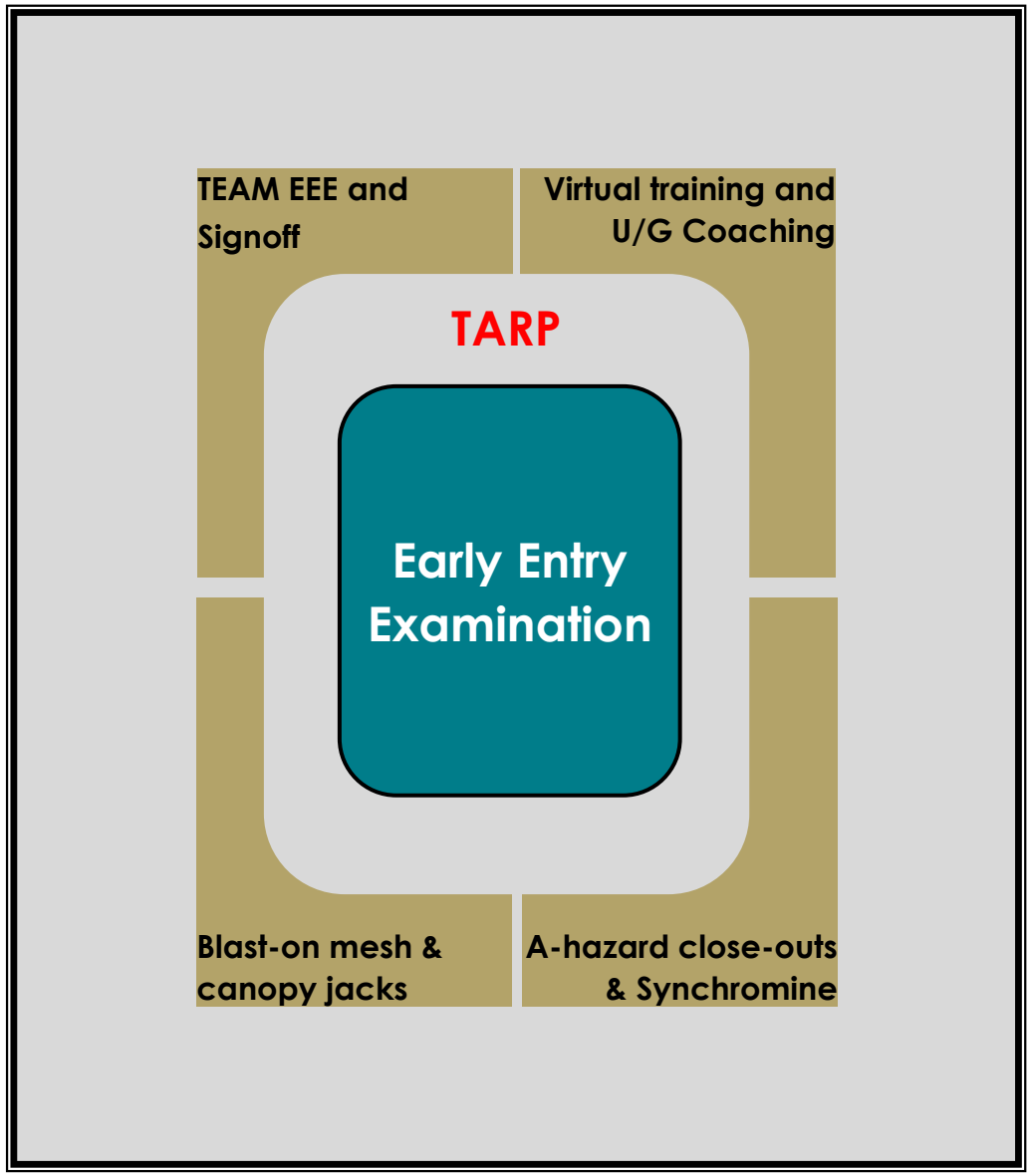
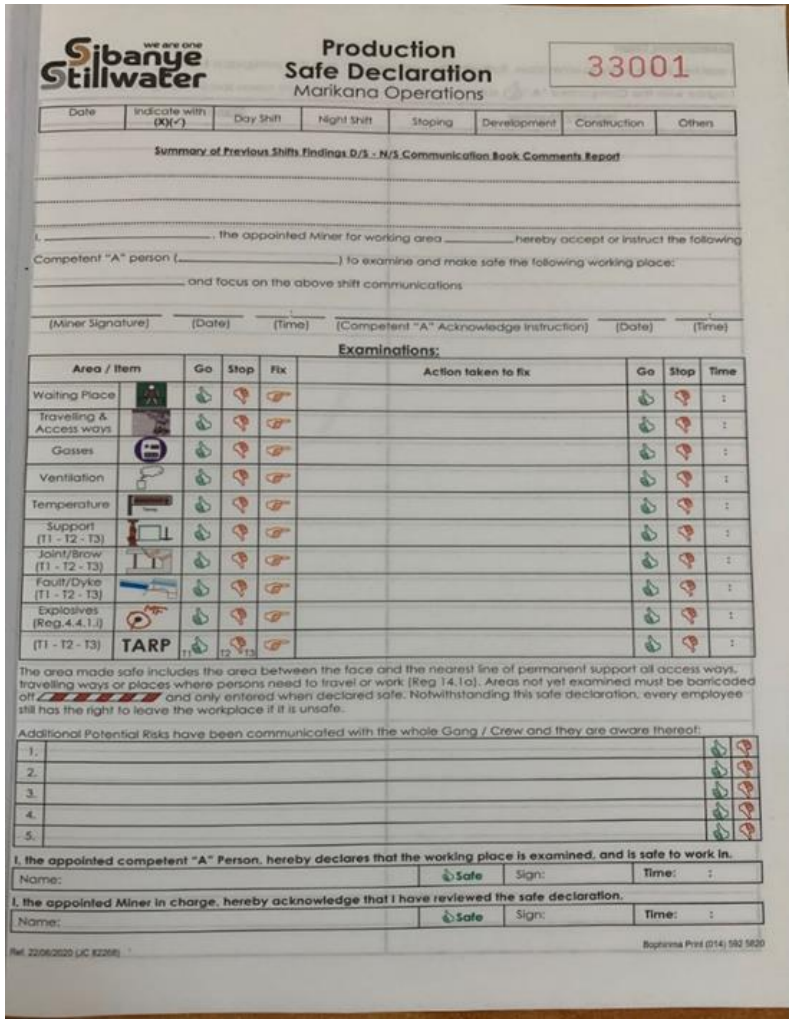
EEE improvements

Improvements



TARP



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Production Safe Declaration
Marikana Operations

33001

Date	Indicate with (X)(✓)	Day Shift	Night Shift	Stoping	Development	Construction	Others

Summary of Previous Shifts Findings D/S - N/S Communication Book Comments Report

I, _____, the appointed Miner for working area _____ hereby accept or instruct the following Competent "A" person (_____) to examine and make safe the following working place:

_____ and focus on the above shift communications

(Miner Signature) (Date) (Time) (Competent "A" Acknowledge Instruction) (Date) (Time)

Examinations:

Area / Item	Go	Stop	Fix	Action taken to fix	Go	Stop	Time
Waiting Place							:
Travelling & Access ways							:
Gasses							:
Ventilation							:
Temperature							:
Support (T1 - T2 - T3)							:
Joint/Brow (T1 - T2 - T3)							:
Fault/Dyke (T1 - T2 - T3)							:
Explosives (Reg.4.4.1.i)							:
(T1 - T2 - T3)	TARP						:

The area made safe includes the area between the face and the nearest line of permanent support all access ways, travelling ways or places where persons need to travel or work (Reg 14.1a). Areas not yet examined must be barricaded off and only entered when declared safe. Notwithstanding this safe declaration, every employee still has the right to leave the workplace if it is unsafe.

Additional Potential Risks have been communicated with the whole Gang / Crew and they are aware thereof:

1.		
2.		
3.		
4.		
5.		

I, the appointed competent "A" Person, hereby declares that the working place is examined, and is safe to work in.

Name: Safe Sign: Time: :

I, the appointed Miner in charge, hereby acknowledge that I have reviewed the safe declaration.

Name: Safe Sign: Time: :

Ref. 22/06/2020 (JC 82268) Bophirima Print (014) 592 5820

RISK	TARP CLASSIFICATION	OVER INSPECTION TEAM	FREQUENCY
LOW RISK	TARP 1	Competent A	Daily
MEDIUM RISK	TARP 2	Shift supervisor	Daily
HIGH RISK	TARP 3	Shift supervisor • Mine Overseer • Supervisor Strata Control Officer • Superintendent Rock Engineer • Superintendent Health and Safety • Unit Manager Mining • Mine Manager • Vice President	Daily Within 7 Working Days

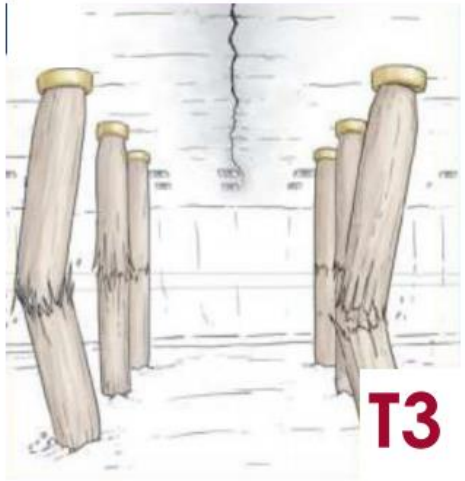
Moved from Allert to TARP System during 2020

Easily understandable triggers

Clear guidelines

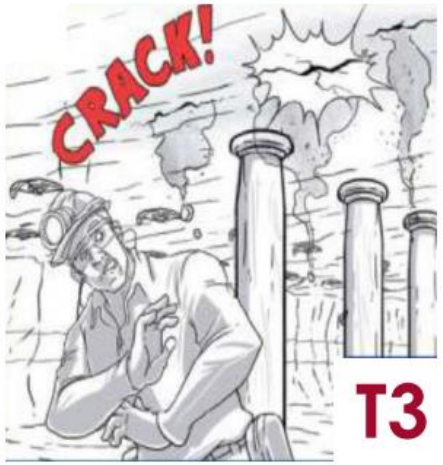
TARP Triggers

POTENTIAL INSTABILITY



Tensile cracks or Abnormal Support failure
Barricade off, document hazard in Safe Declaration Book and notify the "TARP 3" Team

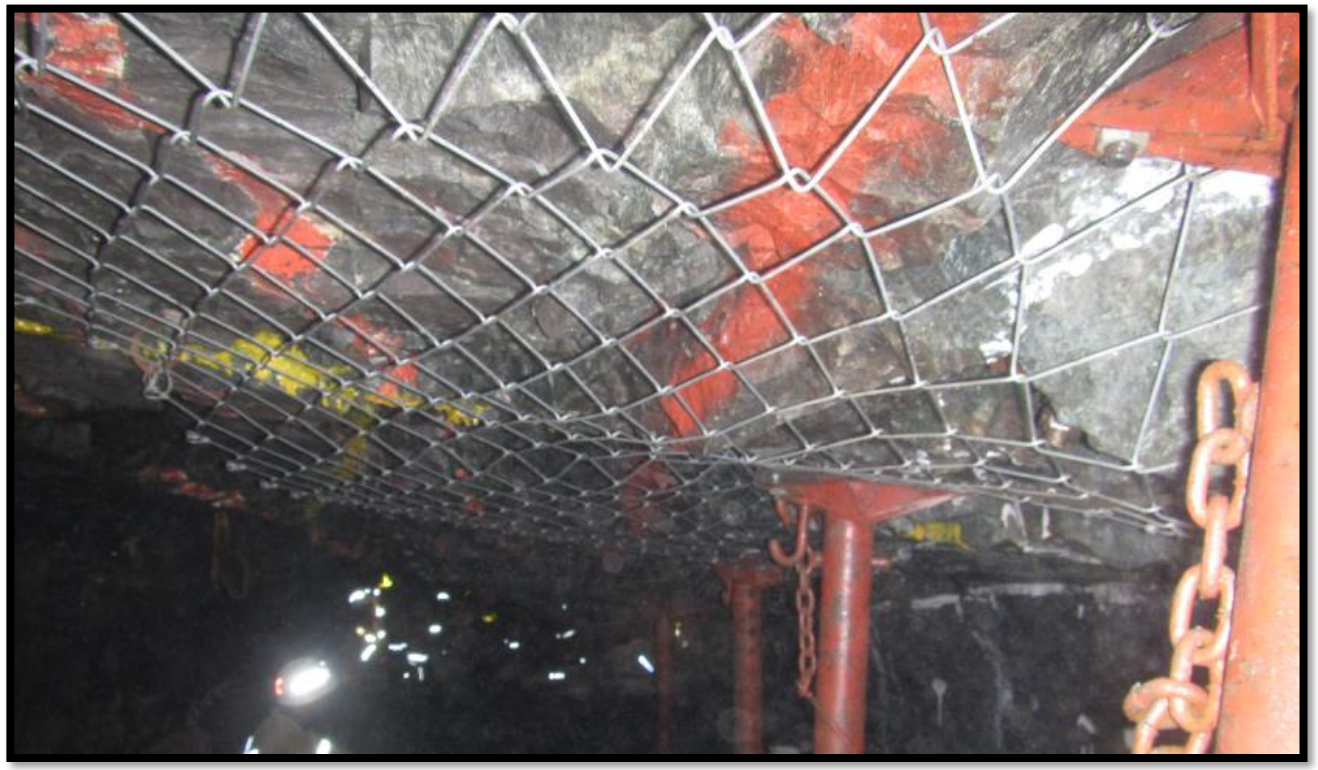
Abnormal Pillar Scaling/Failure
Barricade off, document hazard in Safe Declaration Book and notify the "TARP 3" Team



Increase in Audible Cracking or Dust
Barricade off, document hazard in Safe Declaration Book and notify the "TARP 3" Team

Virtual reality training

Blast-on mesh



Interconnected bolt / net system with high tensile strength

Remote roofbolt drilling

Operator away from direct area being drilled

Opportunities – stinger support feature

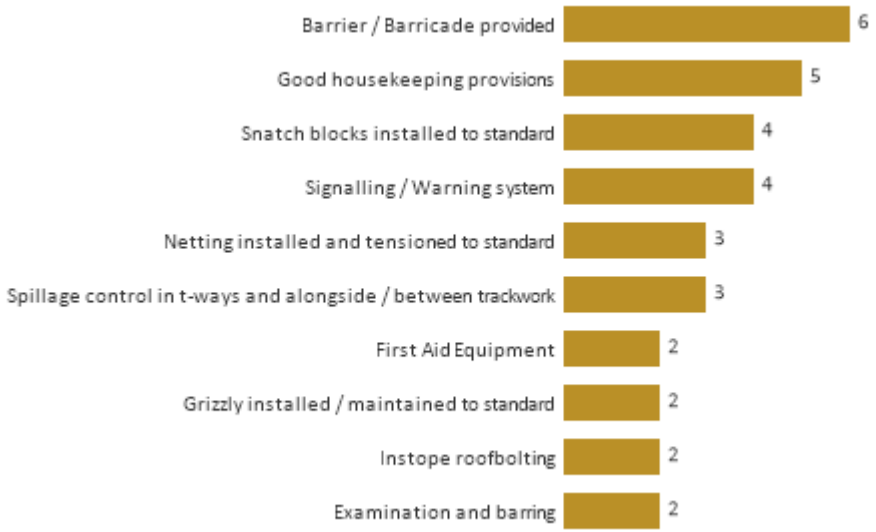
Safety net

Canopy Jack

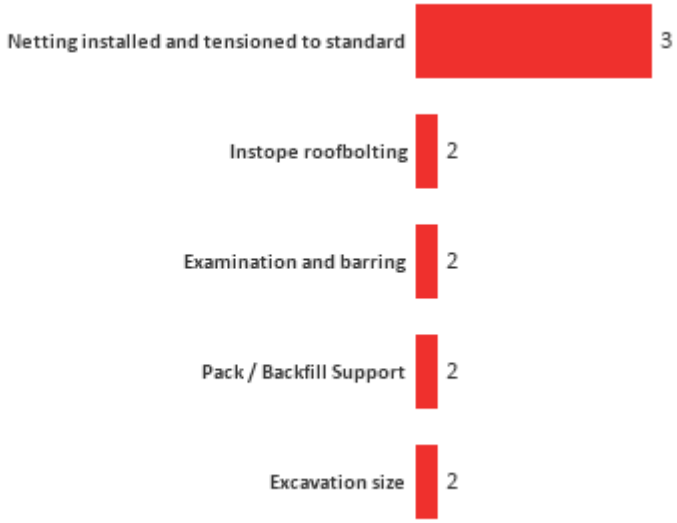
- Installation is done under safe support area at all times.
- Once install it gives you a safe FOG factor of 450kg area of safety is 1.5 by 1.5 within standard of support.
- When installed it gives the user free movement to install additional temporary support while under camlock canopy.
- When the additional temporary support (Camlock Prop) is installed on the front of the camlock canopy net the system will contain a FOG of up to 2 tons.
- Camlock canopy can be used with all camlock props and support that have the ability to attach a net and contain a FOG of 2 tons.

Close-out of A-hazards, addressing leading indicators

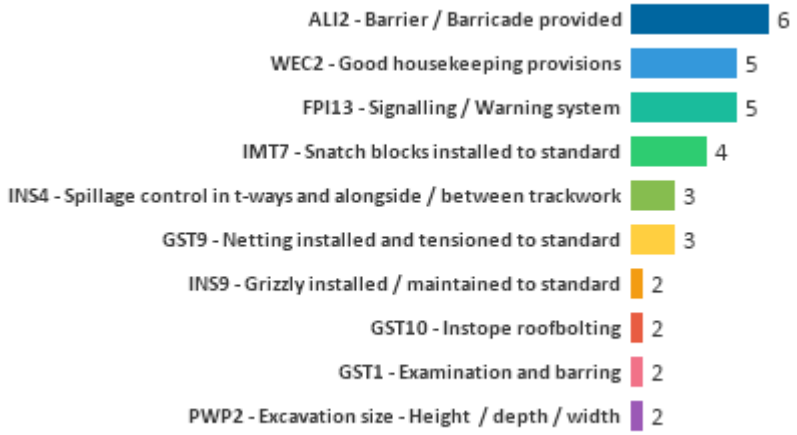
Top 10 A Hazards Item Deviations



Recurring FOG A Hazards by Times Observed



Recurring A Hazards Item Deviations



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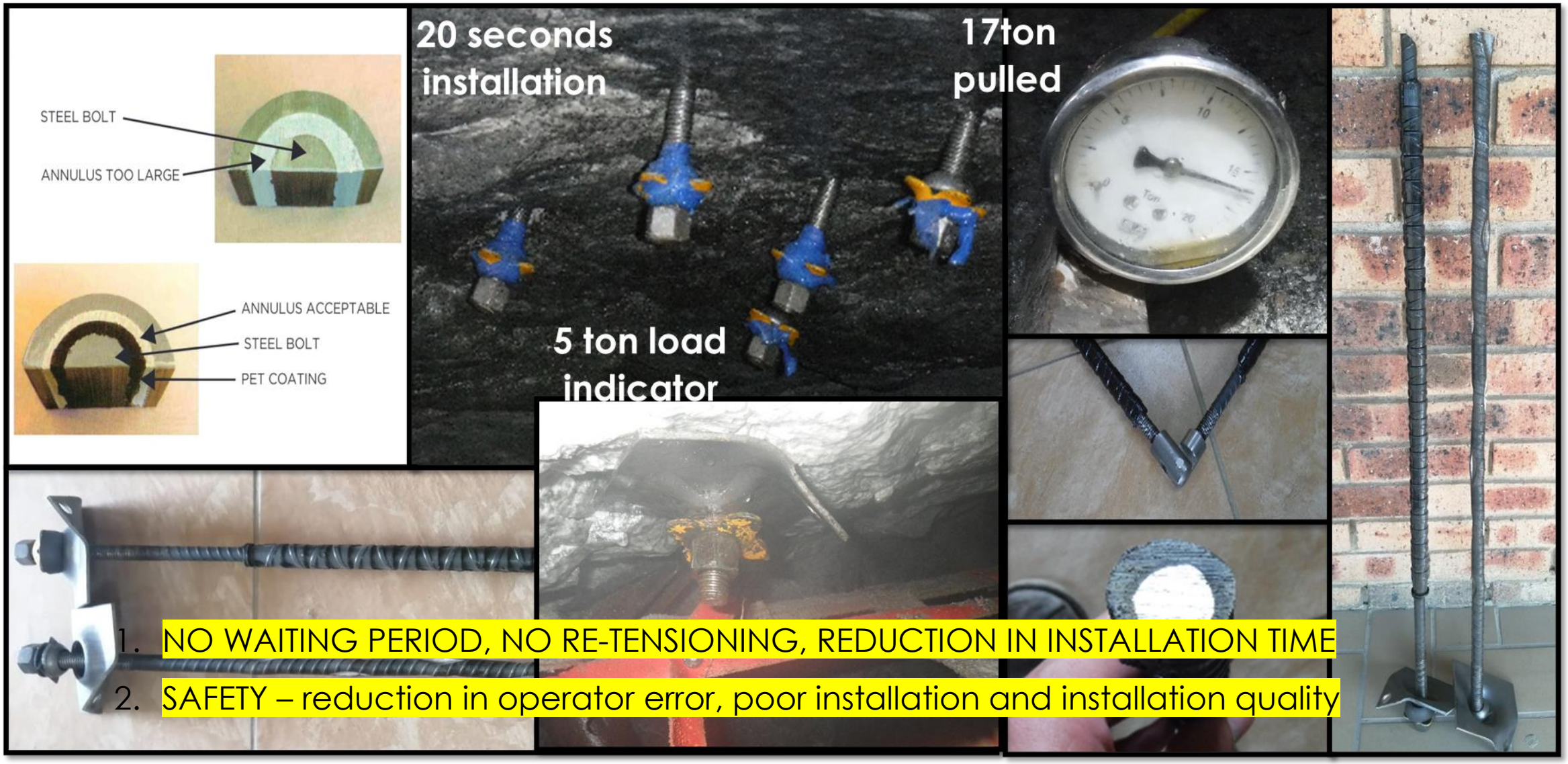
Spin-to-stall resin bolts



1. NO WAITING PERIOD, NO RE-TENSIONING, REDUCTION IN INSTALLATION TIME
2. SAFETY – reduction in operator error, poor installation and installation quality

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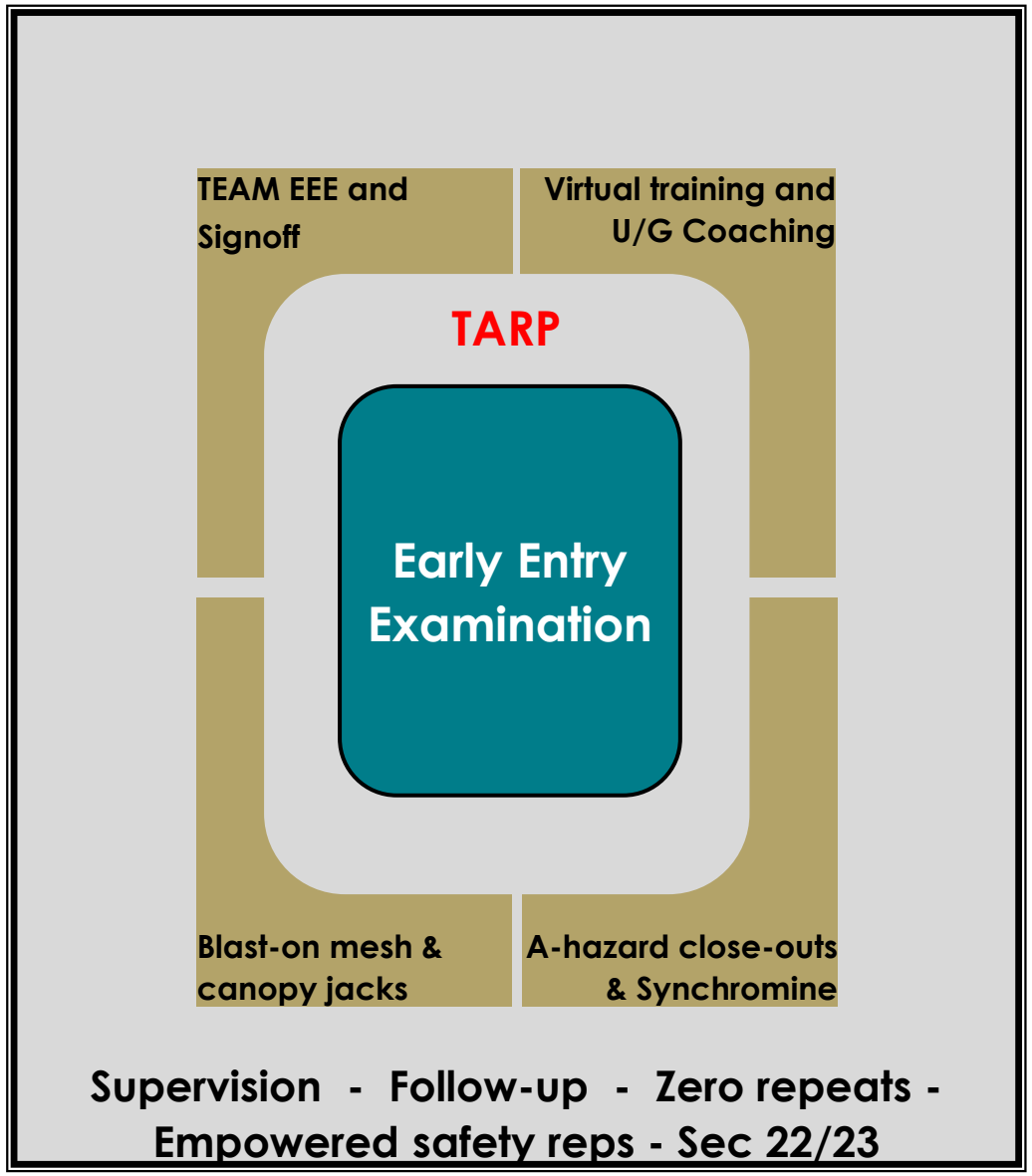
Outcome / effect

Outcome & effect



Clear reduction of FOG related injuries / FOG occurrences

Although very useful, engineering solutions will not totally eradicate FOG related incidents – quality supervision, follow-ups and engaged leadership is key

Clear reduction of FOG related injuries / FOG occurrences

Conclusion

"There is no substitute for an engaged, committed employee who decides to work safe even if no one else is watching"

Questions?

Contacts

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