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Value Improving Practices

will extend life of mine by materializing employees' creative thoughts into tangible solutions

Creativity and innovation are qualities that can help improve operational performance, efficiency and contribute towards the sustainable growth of an organization.

Palabora Copper, has since its inception in 1956, earned a reputation of peak performance earning its status as a leader in the mining industry. Our CEO, Mr. Guangmin Wei has a sustainable solution to escalate the business profile and expand the life of mine. The implementation of the Value Improving Practices (VIP) Division is a heightened call by the CEO, for the workforce to join forces and collaborate for the greater good of PMC and its surrounding communities. Management must drive a workplace culture of accountability, where teams take ownership at an individual level, of their roles and responsibilities and commit themselves to execute beyond compliance or just the employer's expectations.

Aidan Schoonbee (Senior Project Manager Construction) has with the support of the business identified VIP champions that are strategically placed across the business, tasked to implement employee ideas with potential to resolve current and future challenges. The new division kicked off by hosting employees and the UNISA delegation for a career day at PMC and a colloquium at Cajori Hotel, a Knowledge Sharing platform, where sections presented their innovative solutions currently applied on site to enhance production and eliminate or reduce risk at PMC.

The joint venture with UNISA is a strong indicator that the CEO expects the instilling of a work culture that promotes innovation and technical excellence from the entire workforce. Learning and the attainment of formal qualifications through a process of Recognition of Prior Learning (RPL) and formal studies will empower workers and boost employee morale. Moreover, it will enhance production, make the workplace safer and innovative through the application of well researched solutions. Continuous Knowledge Sharing forums will be used as a measuring tool to accentuate continuous improvement for the business to thrive on best practices.



Mr Wei - PMC CEO studying innovative solutions

The VIP team acknowledges and values the "know-how" of the elderly without formal learning within the business. PMC has for years observed, enjoyed and benefitted from their innovative contribution without documenting and publishing




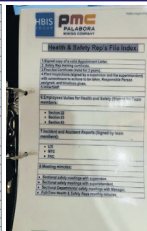
it. Their 'master' knowledge that has enabled us to outperform our competitors, will be documented and applied to modern studies because we believe it has potential to unleash unique and even industry first solutions.

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"The future of PMC is not with me. It is in your hands. Through your collaborations you can keep the operations running for years and leave many legacies within the communities. Learn to acknowledge those amongst you with good ideas, at any level, and give them a chance to assist us resolve our challenges."

CEO, Mr. Guangmin Wei

SEE SOMETHING! SAY SOMETHING AND SAVE SOMEONE!

<div>   </div>	<div>VIP</div>
<h2 style="text-align: center;">Best Practices for Health & Safety Reps to Monitor Compliance</h2>	
Idea Originator: <p>Solly Muvhango</p>	Idea Implementor: <p>Oupa Mongwe</p>
Problem Statement: <ul style="list-style-type: none"> From the previous incident investigation outcomes and Section 54 findings, the element of non-compliance to the system has been found as one of major contributor. This results in business interruptions like Section 54 & significant revenue loss. Investigations further identified opportunity to foster leading approach by making use of Health & Safety Reps. Solution: <ul style="list-style-type: none"> Develop audit tools which assist in proactively identify non-compliance and put remedial actions. Monitor Health & Safety Reps performance against the audit tool. Continuous coaching on opportunities to improve. 	
Value Created: <ul style="list-style-type: none"> Health & Safety Reps contribution towards zero harm journey. Contribute towards elimination of Section 54's due to non-compliance. A day's production loss equates to R20m loss for copper business. 	
Before photo/s: 	After photo/s: 

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VIP

Creating Value from Unused 1000L Flow bins

Idea Originator:

Pierre du Preez

Idea Implementor:

Ishmael Ramoshaba




Problem Statement:

- The waste emulsion used to be stored in large waste cassettes in the underground.
- It would then be transported to surface and manually loaded from the cassettes into 210L drums
- The cost of one waste disposal drum (991013600) is R1 891.66.
- The emulsion is corrosive and steel drums rusted and leaked if they were not removed quickly.

Solution:



- There were lots of unused 1000L flow bins discarded, which could be used for the same purpose. Necessary permission Environmental Dept. was obtained to utilize these flow bins.
- Empty flow bins were then sent underground to be used as waste containers and were also use at the emulsion silo to clean up spillages.


Value Created:

#1	#2	#	Value	Reason	#3	#4
 <p>Warning Chemical waste</p>	 <p>COST SAVING</p>	1	Waste reduction	The flow bins registered as waste can now be reused	 <p>HAZARDOUS CHEMICALS</p>	 <p>Recycle</p>
		2	Cost saving	Leaking 210L drums for treatment cost about R6 000.00		
		3	Less exposure to chemicals	No handling of waste emulsion by hand		
		4	Environmentally friendly	The flow bins are not affected by the corrosive emulsion		

Before photo/s:

After photo/s:



Improving Structural Design to Prevent Downtimes

Idea Originator:

Harry Mamogale

Idea Implementor:

UG Crusher Maintenance Team

Problem Statement:

UG crushers have been in operation for over 20 years. Constant welding and metal fatigue on crushers cylinder brackets was the cause of serious down time (12 – 16 hours), production lost and fatigue to employees.


Solution:

Changed crushers cylinder structural design to 30mm plate with extra support brackets.


Value Created:


- No breakage of cylinder bracket for more than a year since the new installation.
- Crushers team could now concentrate more on preventative maintenance.
- There is improved crushers availability leading to production tons increase.


Before photo/s:



After photo/s:







Challenge Status Quo for Value Creation

Idea Originator: Phillip Liebenberg	Idea Implementor: Schalk Jansen van Rensburg
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Problem Statement:

- Lift II crusher 5 schedule required power supply to be installed by August 2023.
- Steel ducting was necessary for the installation of 11Kv cables.
- The lead time for steel ducting was 10 - 12 weeks leading to potential commissioning delays to November 2023.
- The late crusher 5 start up will have adverse impact on overall Lift II mining schedule.

Solution:

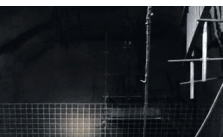
- Instead of waiting for the delivery of steel ducting, the team took the initiative to consider alternative solution which entails:
 - Review design with HDPE piping and structural steel, readily available material.
 - Installation to be done inhouse and only consumable's to be procured

Value Created: (using 6 weeks delays on Lift II Project Schedule)


$$V = \frac{\text{Cost of delays per week}}{\text{Implementation Costs}}$$

Cost of delays per week = R200,000.00 (Crusher 5 delays)
 (4-6 weeks = R5,600,000.00 to R8,400,000.00)
 Versus the total cost spend of R323,055.00 for the alternative method used.

Before photo/s:



After photo/s:





**Our
Positive
Stories**

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MINING COMPANY

VIP

Use of Technology to Enhance Safety and Productivity

Idea Originator:

Tebello Lepheana

Idea Implementor:

George Mtleni

Problem Statement:

UG employees highlighted safety hazards that they are exposed to whilst using CMS scanner to collect data for mapping and pillar identification. In addition, the current method has limitations such as time taken to complete the work, reliability of the data and limited mobility.

Solution:

- Use of technology like drones was investigated and found feasible.
- In April 2023, trial commenced and yielded positive results.

Value Created:

- Improved employee morale.
- Eliminate exposure of personnel to unsafe areas at draw points.
- Better data accuracy for decision making.
- Increased efficiency and eliminate waiting time.

Before photo/s:

After photo/s:

VIP

Strengthening Business Analysis for Projects

Idea Originator:

Idea Implementor:

Murehwa Mangere

Ziphelele Coka

Problem Statement:

There was no centralized platform where all projects can be tracked, information on projects is not organized and it is difficult to have access at any time.

Solution:

Have historical information readily available and accessible at all time.
To have a centralized dashboard where all projects can be tracked.

Value Created:

A centralized platform tracks the multiple projects, including visual dashboards with different key indicators relating to different projects.
The reports are readily available to the business at all times.

Before photo/s:

After photo/s:

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Preserve Resource by Using Real Time Monitoring

Idea Originator:	Idea Implementor:
Geology Team	Geology Team

Problem Statement:

- Before the Lift II cave reach Lift I we need to evacuate Lift I.
- Currently, cave propagation prediction relies on numerical modelling simulation.
- To evacuate Lift I in time we need to measure the progress of the Lift II cave propagation to Lift I.

Solution:

Transition to real time monitoring by using smart markers and slough meters.

Value Created:

Preserve Lift I resource and maximise Lift II resource.

Cave Propagation:

Numerical modelling

Monitoring System Design

Drilling of holes

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Better and Improved Performance Through Relining

Idea Originator:

Hendrick Mohale

Idea Implementor:

Auto Mills Mechanical Team

Problem Statement:

Worn out liners and liner bolts were causing major breakdowns in the plant leading to:

- Unplanned funds required for equipment repairs.
- Instrumentation devices were malfunctioning.
- Safety of employees affected due to limited access to ablation facilities and fire fighting equipment.

Solution:

- Stopped auto mills for 14 days to remove and replace the mill liners and bolts.
- Used an external contractor to reline the mills to complete the work on time.

Value Created:

- Plant availability was increased.
- Plant performance and efficiency improved.
- Work was completed in 10 days vs. 14 days which was initially requested.

Before photo/s:

After photo/s:



PMC Attends the 2023 18th Annual SAIMM Student Colloquium

The Southern African Institute of Mining & Metallurgy (SAIMM) is a professional institute with local and international links aimed at assisting and empowering its members source information about technological developments in the mining, metallurgical and related sectors. With an aim to empower young professionals who are about to embark on their careers, in 2002, the institution introduced a Student Colloquium- a platform where the best Mining & Metallurgy final-year students and interns are afforded an opportunity to present their final year projects or projects conducted as part of their Graduate Development Program (GDP) to an audience of industry experts.

On the 29th of September 2023, Limpopo SAIMM branch hosted its 2023 Student Colloquium at Lapeng Guest House in Burgersfort, Limpopo. Prospective authors nationwide, were invited to submit titles and abstracts no longer than 500 words in length under the topic **Impacting the Mining and Minerals industry as a Young Professional.**

Palabora Mining Company sent 5 diligent best performing young professionals from its pool of top

talent Metallurgy interns within the Training & Development Graduate Development Program. The team of 5 displayed exceptional commitment and professionalism presenting their groundbreaking innovative projects at the conference. Special thanks to PMC leaders: Mr. Eric Mualusi, Dr Robert Khumalo, Mr. Muxe Ndlovu and Mr. Solomon Ledwaba for their people orientated approach, seamless collaboration, and immense contribution for taking accountability and investing time to coaching and mentoring our team. Their efforts were not in vain as all 5 delivered beyond expectation and a huge congratulations to Mr. Kabelo Machaba for attaining second position in the best presenter category.

“The drive and dedication with which all 5 young professionals worked with towards their goal was beyond our expectations and their commitment has evidently brought them the best results despite the many obstacles that were in place and kept challenging themselves.” Thabitha Moyana, Superintendent Learning Programs.

No	Learner Details	Presentation Topic
1	Tony Mokalapa	Magnetic separation processing plant performance rebase-lining.
2	Millicent Malungane	Dense Medium Separation (DMS) circuit optimization.
3	Koketso Mahlane	Evaluation of sampling frequency for magnetite processing metallurgical accounting streams.
4	Kabelo Machaba	Optimization of low-grade iron ore tailings reverse flotation by response surface methodology and desirability function analysis.
5	Phumzile Hlungwani	Integration of magnetite processing plant 1 and magnetite processing plant 2 (HBF) for optimal dewatering process.



VIP

Optimising Pumping Efficiency

Idea Originator:

Gavin Meredith

Idea Implementor:

Xolisa Sidandala

Problem Statement:

UG has been using Sulzer multistage pumps to pump water from underground to surface. The average operating period of these pumps has been around 192 hrs before failure. Cost of repairs after failure comes to over R3.5m per pump.

Solution:

Change from Sulzer multistage pumps to Scamont multistage self-balancing pumps.

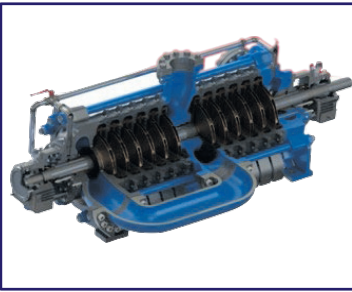
Value Created:

- Cost saving due to long run e.g. Scamont pump operated more than 14 months without failure.
- Wear on wear plates very minimal as it was from 0.5 – 0.9mm.
- Bearings runs extremely cool with no air support.

Before photo/s:



After photo/s:



VIP

Use Internal Skills to Maximise Value

Idea Originator:

VO Maintenance Team

Idea Implementor:

VO Maintenance Team Members

Problem Statement:

Stoppages of the bus transport created a parking problem at Vermiculite Business as sufficient parking was inadequate. To erect additional parking would have costed R1.4m, which VO was not prepared to spend.

Solution:

Do under roof parking in house at a cost of R250k.

Value Created:

- Avoid spending R1.2m.
- Improve compliance to traffic management plan.
- Boost employees morale which equates to improve productivity.

After photo/s:



After photo/s:



Change is the only constant thing in the world



As circumstances change around us, let us look after our Mental, Physical and Emotional wellbeing. PMC is entering a new era with the launch of the VIP division. We are ready and excited about the shift and equal to the challenge!

RETHINKING OUR PROCESS! INNOVATIVE! IMPROVING! EFFICIENT!

Any queries email me at zani.kutumela@palabora.co.za



VALUE

Improving Practices

PMC is RETHINKING its processes to improve performance by applying research backed methodologies

