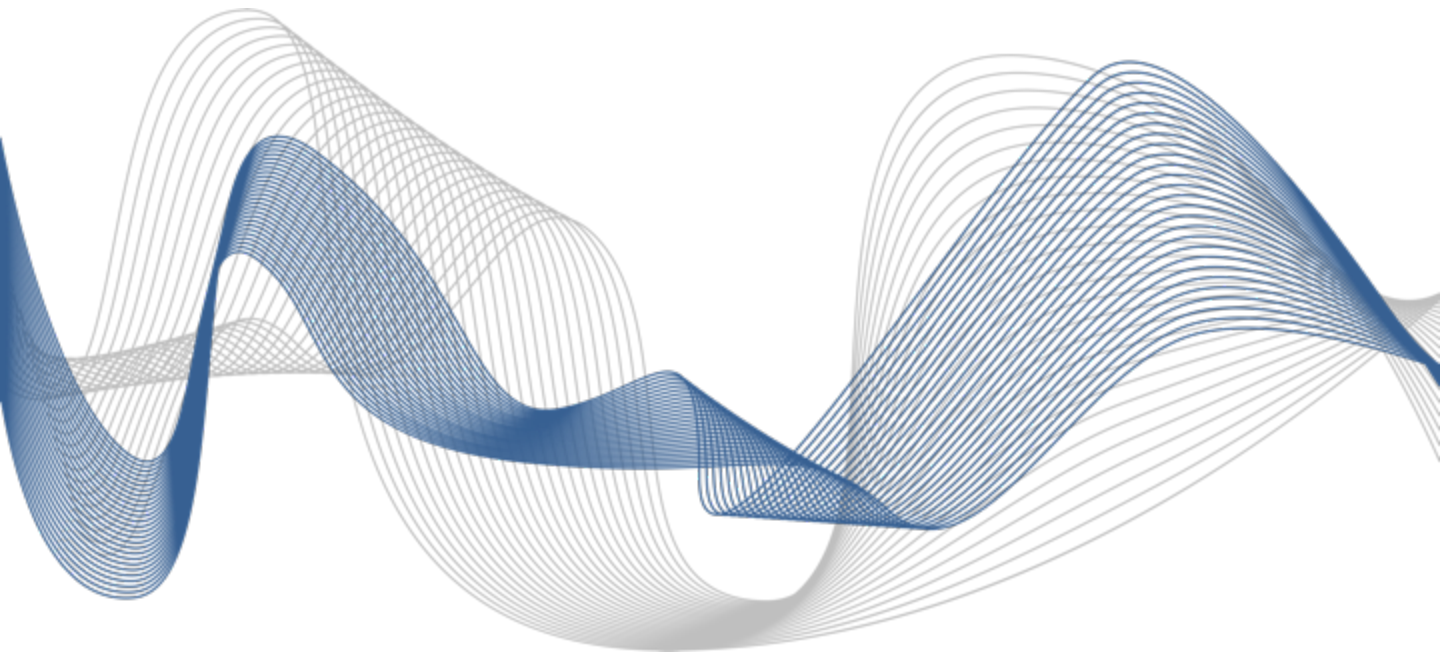




Increased Performance From Improved Planning and Control: A Copper Mining Company Case Study

August 2020





About Kelmic

Kelmic Consulting helps organizations capture opportunities and dramatically improve their operations.

Helping our clients improve their operations since 2002

We partner with our clients to drive bottom-line impact by addressing and dramatically improving efficiencies in People, Processes, and Property. Our exceptional people draw upon more than 100 years of combined experience to bring you the right perspectives and expertise to help you tackle complex challenges and realize your strategic ambitions.



Background

About the Client

- Leading underground copper mine - largest of eight in Africa
- Project funded by World Bank
- Mechanized, trackless underground mining
- Poor condition, old equipment with difficulty securing spares
- Low level of worker skills and very low wages
- LOM plan last updated 15 years back

Production was at less than

17%

of mine's capacity

This leading shallow, underground, copper mine - one of eight producing mines and the largest underground mining operation in Africa - situated on the Zambia Copper belt, had been operating since 1927 with a brief closure in the mid 1950's due to copper prices.

The mine's production capacity was over 7.5 million tonnes ore from which 156,000 tonnes of copper could be extracted annually. The predominant mining method used is "open stope" with the ore body lying at 45° to horizontal in 10-15m thick seams.

The mine supports the entire community with approximately 85% of the local population directly dependent on the mine - employing over 10,000 people.

Following Zambia's independence, in 1964 the mine had slowly deteriorated, and production had slumped. Equipment was well over 15 years old and spares often unavailable.

The mine ran a fleet of more than 70 LHDs in various states of disrepair. LHD reliability was extremely poor and no planned maintenance procedure existed. Several LHDs were "lost" in the mine, left abandoned by operators when they broke down. The mine's production was less than 17% of its capacity and was declining.

Very little short-term planning was undertaken. Mine Captains and Shift Bosses determined where to mine daily and executed "as best they could" until an area was exhausted or required further development for access. The LOM plan had not been updated in 15 years and was not being followed. Mid-term planning (5- and 10-year plans) were constantly updated as mining "records" as geologists and engineers tried to ensure development preceded production and safety was acceptable.

World Bank funding focused on improving output and productivity was secured as part of their infrastructure development program, with established minimum targets for staged release of funds.

A detailed analysis of the operations showed clear scope for significant improvement through implementation of simple planning and daily management, a focused planned maintenance regime and structured training of mid-level management and operators.

Implemented Solution

A full review of the LOM development plan was completed. The new LOM plan fed a new 5- to 10-year plan which was used to drive rolling 2-week operational plans with shift targets.

Reporting on actual production vs targets was set-up. Management meetings through to weekly Mine Manager production reviews were established with corrective action plans.

Incentives for increased performance and improved safety were introduced.

A scheduled planned maintenance system was developed and implemented.

The operational fleet was reduced by 20% including reduction in non-operational equipment used for spares for the operating fleet. This increased LHD availability by over 35% and significantly reduced break-downs and delays due to non-cleared stopes.

A capital equipment replacement plan was developed.

Production increased by over 90,000 lb copper per day.

90,000
lb

increase in production per day

63%

increase in mine output



Key Results Achieved

- Vastly improved planning and scheduling with completely revised LOM plan & daily weekly stope schedules
- Full system-for-managing was developed and implemented
- 63% increase in mine output within 7 months
- Reduced lost time
- Reduced operational fleet by 20%
- Production increased by over 90,000 lb of copper per day
- Project ROI > 9:1 within 12 months

ROI

9:1

63%

Improvement in
mine output

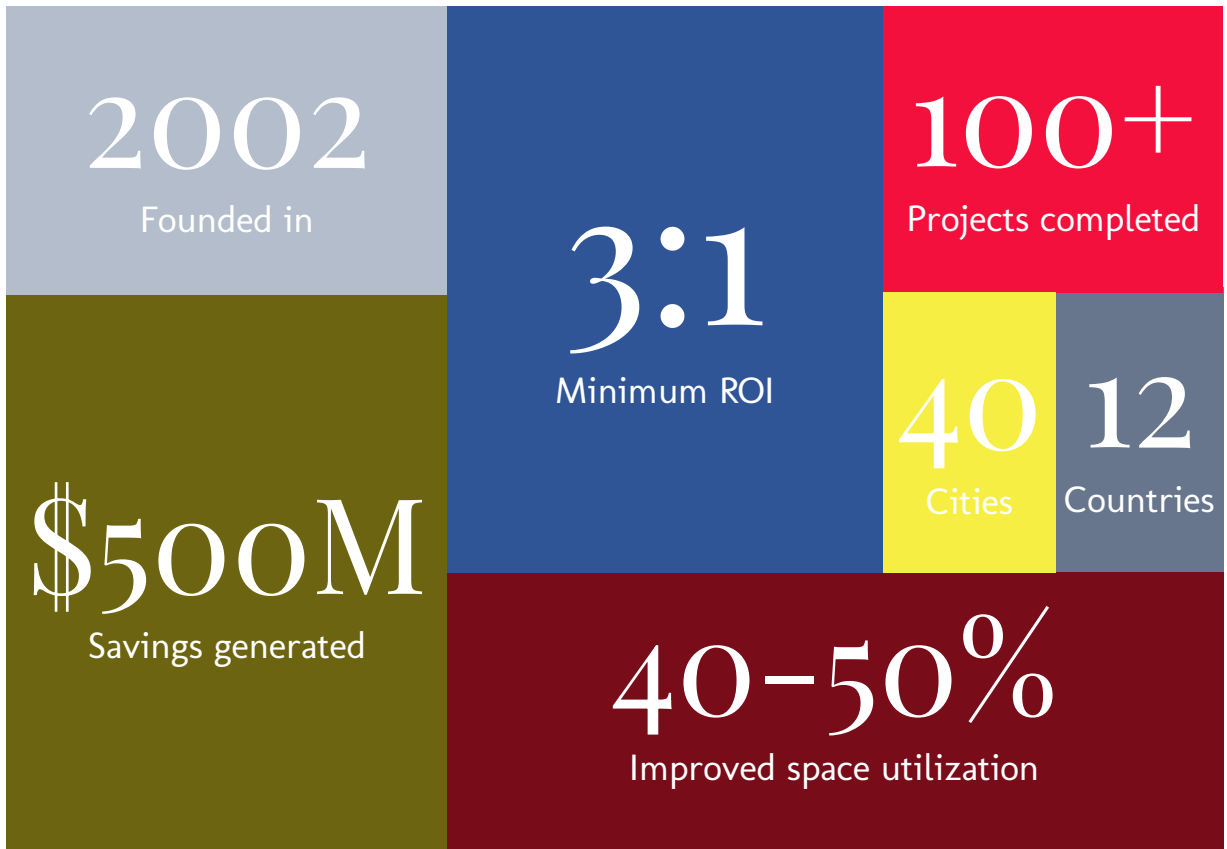
Improved

LOM plan

Increased

Control of resource
deployment

Kelmic at a Glance





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