

CASE STUDY: Copper Installation

THE SCENARIO:

Using the current footprint, the customer wanted to replace an existing screen in a Sag Mill copper installation with a General Kinematics STM-SCREEN™. The SAG discharge screen experienced surges of material (25%-40% solids) from the SAG mill, which overloaded their existing screen. During these frequent overload surges, the stroke/throw reduced significantly. This caused a substantial reduction in screen efficiency. The Excessive fines & moisture carryover occurred in the screen oversize feed to the pebble crushing circuit.

The existing SAG Mill Discharge screen had a single deck design of 3.6m x 8.5m and handled less than 1,900 TPH when screening at 13mm. This quickly became the process limitation. In an attempt to assist the movement of material off the deck and reduce the frequency of overloads, the customer decided to incline the screen and upgrade the drive. Even with the modifications, the screen could not meet the desired capacities.

Known Issues:

- Outgoing screen running 1,600 TPH – 30% less than promised
- Process surges above 1,900 TPH – caused unit cracking leading to downtime
- The plant capability is between 2,400-2,700 TPH – 33% - 40% more than current screen capacity
- Their PSD showed 90% passing 13 mm

ROI CALCULATION:

- **10 Million TPY difference as compared to the former screen's historical tonnage.**
- **Assuming .3% copper concentration with a price point of \$2.50 lbs. (as of July 2019)**
- **Customer payback with all costs included and fully loaded = 3 days**

SOLUTION:

Higher Retention Time

General Kinematics' STM-SCREEN™ retains material for approximately 26-33 seconds versus a typical brute force screen that retains material for approximately 6-8 seconds. The longer retention time allows for an optimized material separation as fines have more time to drop out. Equally as important is the ability of the STM-SCREEN™ to process at a higher bed depth, without sacrificing throughput. A higher bed depth at the screen feed end spreads out across the width, while the increased retention time processes the specified tonnage.

Stroke Consistency

The Two-Mass design utilizes the weight of opposing forces running 180° out-of-phase. During material surge conditions, common in mining operations, the added weight that hits an STM-SCREEN™ does not cause it to dampen out. An STM-SCREEN™ picks up in stroke as material surges. This consistency of stroke ensures that there is no loss in screening efficiency. Material surges on competitive brute force screens dampen the stroke and diminish screen efficiency.



CONCLUSION

Decision-makers from both the corporate office and the mine site agreed General Kinematics' calculations were accurate. The efficiency improvement, even at depressed copper prices, **returns the full investment in the GK STM-SCREEN™ in days.** The customer's pain with their SAG MILL Discharge screen being the bottleneck moved them to act. With the screen installed and running immediately upon startup, all research is validated. The customer's decision to choose the STM-SCREEN™, better technology, is proving a massive success.

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