

Rio Tinto's Kennecott Utah Copper Copperton Concentrator Plant

Manufacturing

Rio Tinto's Kennecott Utah Copper Company (KUCC), is the second largest copper producer in the United States currently providing 25% of all U.S. copper supply. Located in the Salt Lake City Valley, KUCC has been in operation for 108 years. They have produced more copper—19 million tons—than any other mine in the world. Every year the ore that is processed at the concentrator plant yields 269,000 tons of copper, 500,000 ounces of gold, 4 million ounces of silver and 28 million pounds of molybdenum production.

CHALLENGE

Kennecott Utah Copper operates the Bingham Canyon Mine concentrator plant, a smelter and a refinery. Ore from this mine is concentrated into slurry, piped to where the smelting process occurs and then sent to the refinery. Efficient operation at the concentrator stage is critical to maintaining uptime of the smelter. Each year the concentrator plant is shutdown a total of 36 times. This is necessary to maintain critical equipment — as essential repairs and upgrades are completed.

The issue at Bingham was that the length of down time was causing a bottleneck in the overall process. As the production process is suspended, so is the sale of copper and other associated materials representing millions of dollars in lost revenue. KUCC has a strong corporate culture that produces many highly-skilled and experienced staff passionate about their work. Even with remarkable dedication and hard work, the shutdown process continued to show variations in the stated time, cost, and scope. With a commitment to improve this result, KUCC invited Kepner-Tregoe (KT) to assess the situation and work with their team to eliminate the bottleneck.

SOLUTION

KT collaborated with the Asset Management Team to identify, develop and implement an expanded version of KUCC's shutdown process. Job one was to produce a successful maintenance cycle—shutdown and restart of the concentrator plant. Working closely with the KUCC team on daily activities of Shutdown Management, emphasis was placed on definition and planning. Key process steps included developing objectives, sub-projects with detailed work break downs, resource constraints and leveling, risk assessment and implementation. Process design and implementation included creating a visible process map, integrating a new shutdown

(continued)



Pictured: mills used to process ore shown in the concentrator plant

Scorecard

- Over \$11 million USD saved during the first year of implementation
- 60% improvement in team performance (measured by, on-scope, on-time, on-cost)
- 50% reduction in shutdown administrative work load
- Dramatic improvement in Key Performance Indicators against prior years

process with existing KUCC systems, and managing all touch points with internal teams. Close coordination with stakeholders assured inclusion of organizational needs as well as setting up expectations.

Having completed a successful shut cycle, the next step was to develop KUCC skills to ensure successful shutdowns in the future. This was accomplished through daily on-site coaching and mentoring of the shutdown team. KT's Learn and Do application was used to coach team members to Define, Plan, and Implement shutdowns. This application provided a framework to identify many crucial aspects of the shut that were hidden from view in previous planning.

With new processes in place and all teams aligned, ownership and daily management were transferred to the Shutdown Management Coordinator. KT coached KUCC management to embed new processes in the DNA of the organization, making improvements sustainable. Team members were taught how to conduct inquiries with individuals and groups, how to gather proper data, how to identify and remove barriers to success, and how to monitor and implement continuous improvement solutions.

Finally, to ensure sustainability, an audit of the shutdown process was performed and a gap analysis conducted. Based on the results, team members were coached to concentrate on areas where opportunities for improvement existed.

RESULTS

The collaboration and implementation paid off. The shutdown process saved over \$11 million in the first year of implementation. On-time performance improved by 60% and is tracking towards world class results. Key Performance Indicators (KPIs) for shutdown performance improved over all prior years. Team performance (on-scope, on-cost) improved by 60%. Shutdown administrative work load fell by over 50% allowing team members to focus on other areas such as reducing cost or generating more revenue. All Injury Frequency Rate (AIFR) improved, advancing a strong safety culture which is a core value of KUCC.

The concentrator plant improved to the point where it is no longer the bottleneck in the process. Team confidence has increased as stress has been reduced. There is a renewed sense of confidence at KUCC as they now manage their business proactively.