Mining Media Handling Project

Overview
Metso wants to develop a media handling solution (machinery and/or process) to enhance safety, reduce maintenance time and labor, and minimize capital costs to support the operation of a VERTIMILL® Grinding Mill. Media handling process currently in place results in 24-36 hours of down time, which may result in large financial losses to Metso’s customers. The team has developed mill operations layouts that improves the media discharge and recharge process, facilitates liner replacement, and ensures employee safety.

Objectives
Reduce total mill down time by twenty-five percent, improving the media handling process through the inclusion of a more automated and efficient media handling system.

Approach
- Brainstorm and compile white paper on possible new machine design, improved or new processes.
- Explore, identify and deliver a possible media handling system that will decrease media discharge, recharge and liner maintenance total process time for a VTM-3000-WB.
- Develop a mill operations layout that optimizes media discharge, recharge and liner maintenance procedures in accordance with the handling system developed for groups of four VERTIMILL®s.
- Construct a rough system in AutoCAD Inventor for visualization purposes.
- Provide a system that complies or exceeds standards for safety of workers.

Outcomes
The final process design incorporates appropriate automation, reduces down time and facilitates maintenance and ensures employee safety.

1. The Media Removal System facilitates expedited residual media clean out time through the use of a water-jet injection manifold and a slurry pump.
2. The Media Transportation System consists of a repositioned media discharge gate, a sloped pit, and a screw conveyor that allow for media to be transported from within the mill to the implemented recharging system.
3. The Media Recharging System consists of a custom made elevator and a partially automated rail and cart system.