



UPGRADING A COAL TRANSFER CHUTE

HATCH DEPLOYS ALTAIR EDEM BULKSIM SOLUTION FOR MINING

About the Customer

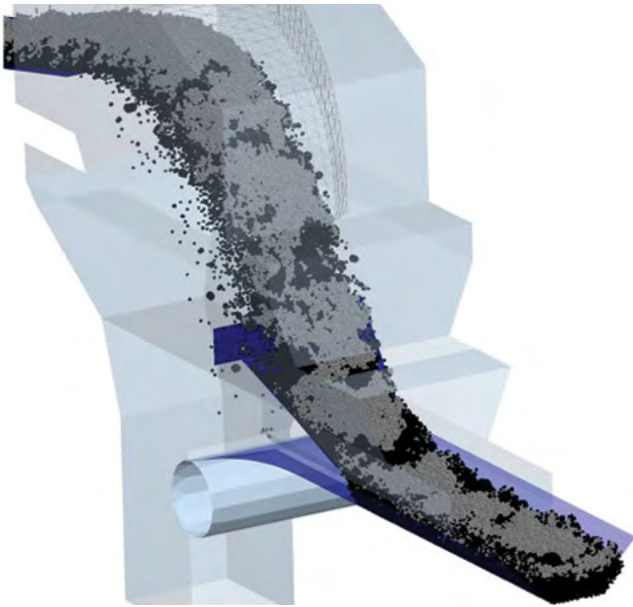
Hatch Ltd. is a global supplier of engineering, project, and construction management services to the mining, metallurgical, energy, and infrastructure sectors.

Hatch deploys EDEM BulkSim to explore “what-if” scenarios, while performance testing and verifying complex conveyor transfer point designs.



Over the past several years Hatch has been integrating EDEM simulation technology and services into design projects and has achieved a high level of confidence in materials handling equipment designs. This results in substantial benefits around design robustness, equipment reliability in plant start-up and commissioning, and increasing plant quality, yield and performance.

Dr. Brian Moore, Lead Engineer, Bulk Materials Handling, South East Australian Hub, Hatch



Their Challenge

Hatch was contracted to upgrade the conveyor transfer point at an existing coal preparation plant. Hatch's client required upgrades to accommodate a scheduled increase in production. The conveyor carried coarse product coal, topped by a layer of filter cake with a high moisture content. The existing chute was prone to material build-up of this "sticky" filter cake, often plugging during surges in flow rate and causing costly downtime. Although a relatively small conveyor, at 1,200 t/h, it was critical to ensuring constant product throughput to truck-loading bins. Hatch deployed EDEM BulkSim to design and validate a new transfer point for use under various operating scenarios and levels of filter cake moisture.

Our Solution

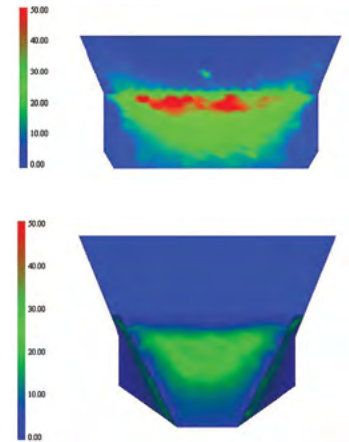
The redesign of the transfer chute was accomplished using the EDEM BulkSim Solution, including Material Testing and DEM Material Model Calibration services. Dynamic flow testing was performed on actual samples of the product coal and filter cake that were representative of actual materials on-site. DEM Material Models were quickly calibrated by comparison of physical test results with simulations, using automated parameter sweeps on a cloud computing platform.

Hatch's new transfer point design included a flop gate, hinged at the top, to direct flow onto one of two flow paths. Virtual performance testing of design options was performed under a range of material flow conditions and included highly cohesive materials. This enabled Hatch to quickly select the optimal configuration for production of the detailed design.

Results

EDEM BulkSim simulation showed that the proposed new transfer point design would provide increased throughput and perform better than expected when dealing with highly cohesive materials and at surge in-flow rates. Hatch was able to verify the performance of the transfer point before fabrication, and simulations showed low wear rates on the receiving chute.

The use of calibrated DEM Material Models provided Hatch with accurate, fit-for-purpose DEM simulations, resulting in a redesign with substantial benefits in equipment reliability during plant start-up and commissioning, and further benefits of increased plant quality, yield and performance for the client.



EDEM BulkSim shows areas likely to experience relative wear on the load chute for the original configuration (top) and updated configuration (bottom). Red indicates high relative wear. Analysis indicates the updated configuration will experience lower wear rates.