



TRANSFER CHUTE OPTIMIZATION

LONGKING EMPLOYS ALTAIR EDEM BULKSIM SOFTWARE FOR TRANSFER CHUTE REDESIGN

About the Customer

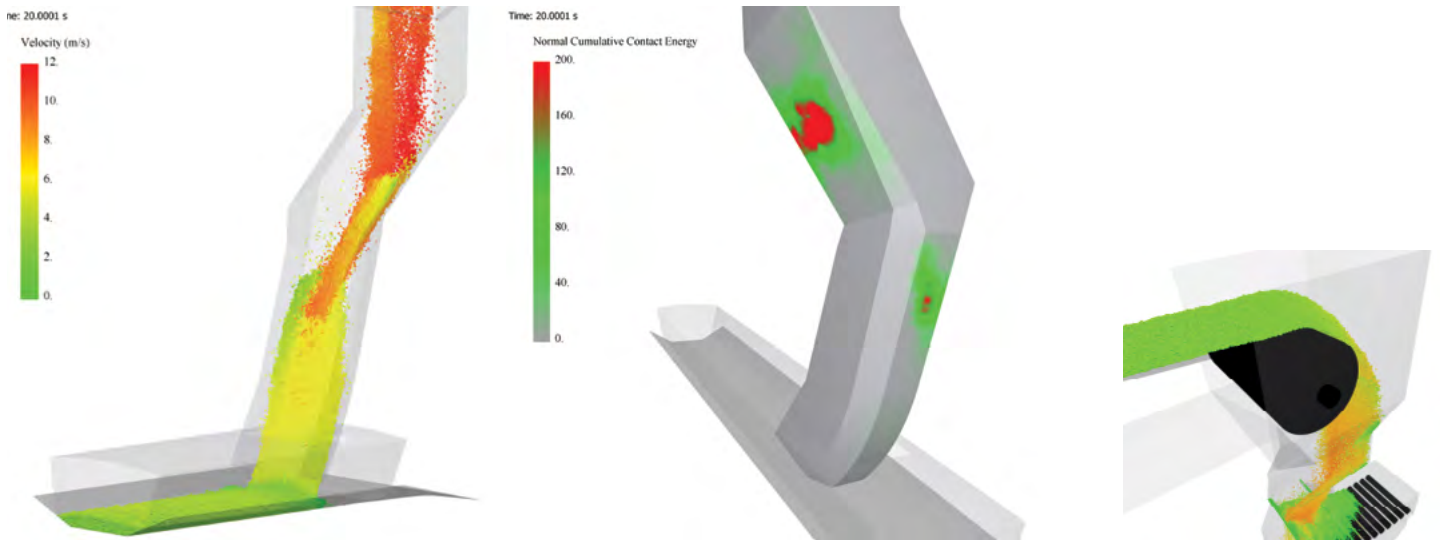
Longking is a large engineering and manufacturing company in China. Longking Bulk Materials Science & Engineering Division is a specialized group that designs and supplies bulk handling and storage equipment for clients around the world.

EDEM simulation technology was used to evaluate issues of blockage and dust emission with a transfer chute and propose a new design that would solve the problem.



EDEM BulkSim was an effective design tool to model the flow of coal through the existing design and develop a robust chute design to solve the ongoing problems. The new design has been implemented and the solution has successfully solved the issues.

Rongfu Liao, Chief Engineer of Dust Suppression, Xiamen Longking Bulk Material Science & Engineering Co., Ltd



Their Challenge

At a power plant in China, thermal coal is processed in a tall building to screen and crush oversized material. Several chutes connect the feed conveyor to the screen and crusher where sub 30mm is fed to the outgoing conveyor. The main issues that needed to be addressed in this project were:

- Significantly control and **reduce dust emission**
- **Reduce likelihood of blockages** occurring when handling wet coal
- **Improve loading** on the outgoing conveyor

Our Solution

EDEM BulkSim was used to **run simulations of the existing design and identify flow problems** with dry and wet coal. Post-processing was conducted to evaluate coal velocity at various locations, impact velocity on the lower chute and outgoing conveyor, and presentation of coal on the outgoing conveyor (i.e., side loading). The Longking team also evaluated slip velocity between the coal discharging the lower chute and outgoing conveyor (to assess if the coal is softly loading the belts).

The data and observations from the EDEM BulkSim simulations were utilized to commence redesigning the lower section of the chute. Several design concepts were developed. To determine which design was optimal, EDEM BulkSim simulations were conducted to **evaluate the performance of each design**. The final design shows improvements including:

- Controlled flow in spoon chute
- Soft loading on outgoing conveyor to reduce dust emission
- Improved velocity profile on outgoing conveyor
- Improved central loading on outgoing conveyor

In addition, a relative wear analysis was conducted in EDEM BulkSim to examine the normal (impact) wear and tangential (abrasive) wear on the new lower chute. **This analysis assisted Longking engineers in designing the wear liner package.**

Results

EDEM BulkSim's ability to **accurately simulate the coal flow** through a crushing and screening station enabled Longking to gain greater insight than using traditional design methods, and to be confident that the design would perform well with low probability of blockages while reducing dust emissions. In addition, EDEM BulkSim visualization helped Longking demonstrate the design solution to the client and increase their **confidence that the solution would work to solve the issue.**

Longking used EDEM BulkSim to evaluate transfer chute design and improve efficiency.