ASGCO® - 3-DEM Analysis of Existing Bucket Reclaimer and of a New Bidirectional Design Bucket to Verify the New Design Will Achieve the Same Output as the Existing Design.

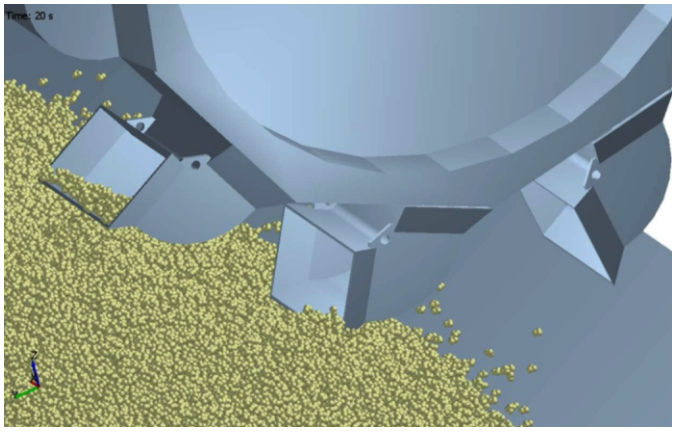
Industry	Boron mine
Application:	Bucket Wheel Reclaimer
Material:	Borax Ore, Tincal Ore; 5” minus
Product:	ASGCO® 3-DEM Analysis
Objective:	Conduct an analysis of the existing bucket design to establish a baseline and then performed the same tests on the new bidirectional split bucket design.

Details: **Bucket Wheel**

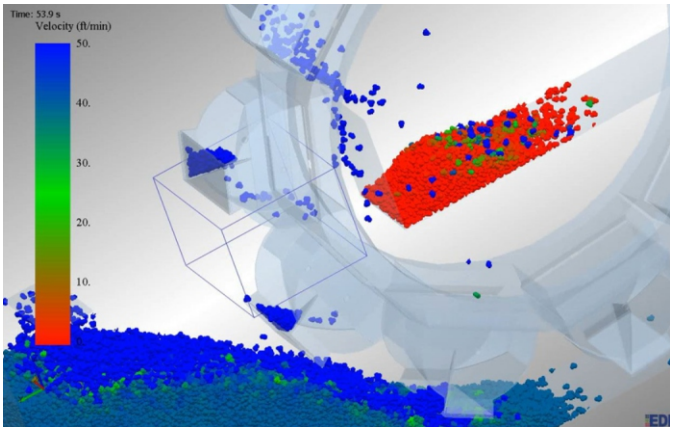
Capacity:	400 STPH
Bucket Wheel Drive:	4.4 RPM
Carriage Traverse Speed:	40 FPM

Challenge

The driving force behind this project was initiated out of a safety issue. The existing bucket design would require 3 to 4 operators to manually flip the buckets which would put the operators in a dangerous position as the buckets are very heavy and could cause an injury during the process of flipping the bucket to change direction. Therefore corrective actions resulting from an incident investigation were to redesign and re-engineer the bucket to enable the bucket wheel to change direction without flipping the buckets. Due to the split design of the new bucket the challenge was to ensure the same tonnage would flow thru the bucket without any restriction.



Existing Bucket



Split Bucket Design

Solution:

The existing bucket wheel was modeled and a 3-DEM analysis was performed to establish a baseline of existing performance levels. We then incorporated the clients models of the new split bucket design into the 3-DEM simulation and then compared the differences between the two designs and provided data to the client to show results of the simulations. The client was then able to view the results and make modifications to their design to improve the material flow and capacity.

Results

After the new split buckets were installed on the bucket reclaimer they were able to realize the time savings of not having the maintenance downtime to flip the buckets while maintaining the same capacity. They also found another benefit to the split bucket was that it evened out the distribution of the material on the belt, previously with the original bucket when the material was transferred to the conveyor belt it would leave piles of material on the belt with the split bucket the material was more evenly distributed on the belt. Therefore reducing the impact and wear on the belt.