Improved safety, loading time, and delivery accuracy

Efficiently loading the vehicle with the finished product

The bulk trailers, which are loaded underneath the finished product silos at Agrifirm's cattle feed factory in Oss, have been loaded using a new multi-compartment system since the spring. This results in shorter wait and loading times. It also improves safety and delivery precision.

For years, there was a strong desire to load the bulk trailers at Agrifirm's cattle feed factory in Oss more quickly. The factory was built in 1986 and has since seen enormous growth in its turnover. However, very little had been done to modify the vehicle loading system in the meantime. The factor currently produces an average of 2000 metric tons of cattle feed per day, sometimes reaching outputs of over 2200 metric tons in a single day.

With the arrival of the new multi-compartment system, the number of loading lanes has been reduced from nine to two. Since then, staff members, drivers, and clients have noticed that it has become significantly calmer on the property. This is due to shorter wait times, rapid loading speeds, and the fact that it is no longer necessary to take a detour between the loading lanes and the weighing bridges.

The number of loading stations has been reduced from nine to two.

Requirements

There were various arguments for investing in this new system. Loading times that averaged over an hour had to be reduced to six to ten minutes. Agrifirm also wanted to refine its delivery precision to a maximum of 100 kg. However, the goal was to reap several other benefits as well: increasing safety around the bulk loading area, reducing CO_2 emissions, eliminating the wait times for drivers during the loading process, improving working conditions, and reducing noise and dust as well as the volume of returned product due to overloading the trailers. The final condition was that the investment would have to pay for itself in under four years.

Successful project

"All the criteria presented by management have been satisfied," according to Hennie Jeukens, Business Manager in Oss, and Ido Schutte, Manager of Cattle Feed Production, Innovation, & Technology for Agrifirm Nederland.
"We had set the bar high. After taking a look at the businesses of our colleagues, who were in similar situations, we began to realize that we should operating at a more efficient level," explains Schutte.

Realization
The mechanical installation was delivered and assembled by Ottevanger Machinefabrieken. The conveyor belts were produced by Abresch Constructie- en Machinebouw. Actemium Nederland handled the automation. The electrical system was supplied by Vandoorn. Bouwbedrijf Berghege was responsible for the construction work. The preliminary design and part of the tender process were handled by Bilfinger Tebodin.

The budget and available space did not allow for more than two loading lanes. "Armed with our own ideas, we approached Bilfinger Tebodin and they supported us by implementing our key principles in practice. The engineering process went through several stages, ultimately proving that our expectations would be feasible."

Multi-compartment sets

"We looked at several different scenarios beforehand. We came to the conclusion that four transport lines, each with a capacity of 150 metric tons per hour, between the finished product silo — 6000 metric tons — with roughly a hundred silos of 20 to 150 metric tons and the loading locations should be enough," explains Schutte. "Three lines for pellets and one for meal. After three months in operation, this has proven to be more than sufficient. Each multi-compartment set, comprising twelve bunkers of four metric tons, can be simultaneously loaded by two transport lines, reaching a capacity of 300 metric tons per hour. The number of multi-compartment sets is six, which is limited."

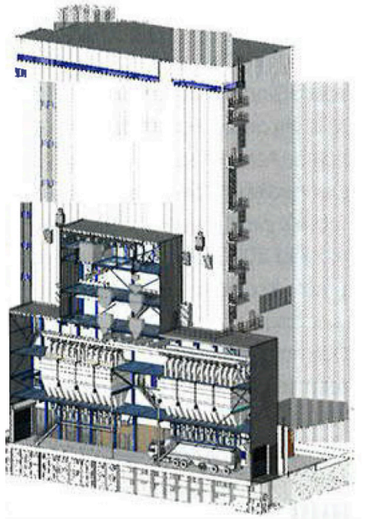
Jeukens adds: "The first vehicles leave at 5:00AM and the last one to be loaded leaves at 10:00PM. The swiveling, telescoping unloading pipes are situated in such a way that each vehicle can be loaded in a single instance from each of the loading sets. At night, these sets have already been loaded, just like the 14 vehicles. This means that each day begins with 600 metric tons of finished product ready to be unloaded."

Production is based on supply and order volume. "Troublesome as it may be, we receive about five rush orders on average per day that don't fit neatly into the schedule. Of course, we want to be able to serve our customers as best we can," says Jeukens.

Hennie Jeukens and Ido Schutte were involved during the development of the new system.

Flexibility

Each day, about 60 different types of feed — for cattle (including for those on a non-GMO diet), calves, steer, and goats — are unloaded along with 25% customized feed blends, which must all be sent out for delivery. "Raw materials can also be loaded. The bulk trailers sometimes drive from factory to factory, even to and from fellow manufacturers on occasion. According to Schutte, the current flexibility of the system is the most important step forward. "Each finished product silo is connected to every multi-compartment bunker. This is very flexible, so there is no need for detours anymore."


A 3D cross-section of the Oss factory with the new loading area.

Loading process
The loading process begins with the driver communicating their upcoming arrival, which is done one hour in advance. Once this alert has been received, the loading coordinator clears the roadway. When the bulk trailer arrives, it is sent to weighing bridge 1 to measure its unladen weight. After checking that the cargo in the multi-compartment set is read, the driver is directed to the appropriate loading area.
The loading process itself consists of the following steps: positioning the bulk trailer, registering with a pass, hanging loading pipes over the correct compartment, using a button to operate each compartment for both initial loading and finished product loading, another measurement at weighing bridge 2, and finally, departing the property.