



Case Study

Doubling a Conveyor's Capacity - New Drives and improved Control allow twice the Conveying Capacity

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A South Korean cement factory needed to increase the capacity of their plant. Therefore, the conveying capacity of the conveyor connecting the open pit and the cement plant needed to be doubled. This was achieved by doubling the conveyor speed, as described below.

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Voith TurboBelt DriveControl was implemented on one of the world's longest single conveyors. (Pictures: © Voith Turbo)

Voith was chosen by SsangYong Cement to engineer and install a belt conveyor drive and controller system in its Donghae plant in South Korea. By implementing, their Turbobelt drive control, Voith managed to overcome local challenges in the material handling process in order to double the production of the limestone quarry. Having experience with Voith components in their conveyor system for almost 20 years, Ssangyong consulted Voith for this retrofit project. The goal to

increase the conveyed tonnage from the main quarry to the cement plant by 100 percent was achieved by making essential technical changes.



SsangYong Cement doubled the conveyed tonnage on its Donghae plant.

The conveying route is covered by two belt conveyors with the longer one, a 12.8 km one-flight conveyor, belonging to the five longest single conveyors worldwide. After an initial analysis of the conveyor system, the belt speed was doubled from 3 to 6 m/s to increase the conveying tonnage. In order to facilitate the increase in

speed, not only the gear ratio had to be changed, but also the installed drive power. The most cost-effective solution was to install completely new drive trains on the long belt conveyor called SB500. The installed power is now 2 x 1.2 MW at the head and 1 x 1.2 MW at the tail of the conveyor. The existing Voith drives of the SB500 were used to double the number of drive trains on the shorter SB200 (2 km long) conveyor. After more than 20 years of operation, the drives only needed a maintenance check to be connected with the new controller. The new configuration of the SB200 drive system consists of 4 x 600 kW installed power at the head equipped with new gearboxes. In addition to the new drivetrains, the overall performance of the drives was improved. Before the retrofit, the start-up procedure of the long conveyor with 12.8 km took more than ten minutes. The difficulties with control technology and conveyor dynamics in the past could be resolved with the Voith TurboBelt DriveControl.



The combination of Voith hydrodynamic couplings and the respective control system allows for optimized operational characteristics of the conveyor and an increased belt lifetime.

Packed with state-of-the-art technology, the system includes active-load sharing, belt conveyor control, slip detection and remote service capability. Implementing this new conveying control technology extends the belt lifetime by reducing the mechanical stress as well as the dynamic impacts. The Voith TurboBelt

DriveControl now manages to start-up the conveyor fully loaded with about 2,100 tons of stones within half of the previous start-up time. The torque transmission control achieves an extremely smooth and steady acceleration. In order to successfully integrate the Voith TurboBelt DriveControl, Voith cooperated closely with the SsangYong project management and the supplier of the plant control system. Mr. Dukgi Lee, General Manager of the plant and maintenance team of Ssang Yong Cement is impressed by the results: "First of all, we thank Voith very much for the technical support during commissioning. While operating this long belt conveyor for the last 20 years, we have never seen such a great start-up characteristic, and control. Due to this retrofit project, we were able to reduce the working hours of plant workers, achieved cost savings, and a flexible operation is now possible. Thanks to Voith's technical support and efforts, the plant will enjoy sustainable operations providing value to its community, its owner, and the employees."

About the Author

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