FIELD SERVICE TO REVIEW HAC AT ST MARYâ??S CEMENT

Description

Industry: Cement | Service: Engineering

CHALLENGE

Evaluate issues occurring on the Sandwich Belt high angle conveyor system used to elevate raw mill feed to a silo conveyor.

IDENTIFYING THE CAUSE OF THE BELT BUCKLING AND IDLER WEAR

DSI was asked to investigate an issue in which the belt tended to â??bubbleâ?• in its center and the idler wing rolls were wearing prematurely. The goal of the investigation was to determine if any improvements could be made at the conveyor.

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Bubbling, or buckling, in the center of the belt, most often occurs when belts with an incorrect modulus have been installed on the system. A Sandwich Belt high angle conveyor uses low-modulus belts in order to properly accomplish its tight curve radii. This belt is most typically of a nylon-nylon construction, which was quite common at one time, but has become less readily available as the large number of conventional conveyors in the world have shifted to polyester-nylon construction for the benefit of its short take-up length. Accordingly, many belting supplier representatives will recommend replacement of Sandwich conveyor belts with the more readily available poly-nylon belting, unaware of the consequences.

RECOMMENDED IMPROVEMENT AND CONVEYOR PERFORMANCE OPTIMIZATION

Indeed, upon investigation and discussion, DSI determined that the installed belt was of a polyester-nylon construction, and that the modulus is more than twice what is recommended for this installation. As a result, when the tension prescribed for the correct belt was applied to the non-conforming belt, the belt center remained in a state of compression, and the belt edge was in a state of overstress. That compression could be seen in the bubbling of the belt, and the overstress could be seen in the wear of the conveyorâ??s wing rolls (see Figure 1). DSI recommended replacing these belts with belts that conform properly to the required specification.

DSI had 419â?? of three-ply belt available in stock to suit this installation well. In fact, it was a more appropriate selection than the two-ply belt that was originally supplied, as it better suits the load support requirement of a 42-inch-wide system.

Additionally, belt capacity and speed were considered. It was determined that when the conveyor was running a lighter load of material than its design load, it had a greater tendency to leak material. Customer requested wanted to arrange to speed up and slow down dynamically as the load on the conveyor changes to maintain a full cross-section at all times. As long as the conveyor ran at a rate

lower than the designed 420 tph consistently, the conveyor can benefit from running a lower speed, reducing overall wear and tear. Drives were upgraded from 40HP to 50HP each and a VFD speed control was added.

SOLUTION

Recommend repairs and upgrades.

Contact DSE to discuss high-angle conveyor engineering for your mine or industrial facility.

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