

## OX-n Belt Care Equipment

### TATA STEEL, Jamshedpur

Tata Steel Limited is an Indian origin, Multi-National Steel making company. Its largest plant is located at Jamshedpur, Jharkhand, India. Tata Steel primarily serves customers in the automotive, construction, consumer goods, engineering, packing, lifting and excavating, energy and power, aerospace, shipbuilding, rail and defence and security sectors. The steel plant produces pig iron, soft iron and alloy.

### The Challenge

Tata's requirement was for a belt changing equipment suitable for two parallel pipe conveyors, constructed on the same structure at an elevation. The tail end was at 25m height and head end at 50m height from the floor level. The position for belt change was possible only at the head end and tail end both being pipe conveyors. The head end being located above the Gas Holding station there was no approach possible. The tail end area was also very congested, making it next to impossible to carry out belt replacements in the conventional methods. Another major challenge was to keep the down time of the conveyor system to the minimum, as one conveyor is the feeding stream for blast furnace. This was the first time a belt changing requirement had come up at this conveyor.

### Scope of Work

The scope of work included design, fabrication, erection, commissioning and supervision for belt replacement as a turn key project.

Maximum Belt Width	1600mm, 1850mm
Belt Rating	ST 1800, EP 1250/4
Belt Thickness	24mm
Conveyor Length ( Centre to Centre )	750m
Head End Elevation	50m
Maximum weight of belt	50Kg/m

### Thejo's solution

Thejo's technical experts visited the site and studied the conveyors thoroughly and had detailed discussions with Tata Steel officials.

First task was to identify an appropriate common location for the placement of the belt changing equipment from both the pipe conveyors. The location was identified to be near the tail end tower, and below the conveyor structure.

Thejo's team suggested a Coiler-Decoiler setup, with the coiler used for pulling and winding of the old belt from the conveyor, while the decoiler could also be used to initially winding up the new belt completely.

The Coiler was designed for 8 Ton pulling capacity of the old belt directly from the pipe conveyor without the aid of the conveyor drive, capable of winding 500m (25 Ton) of belt.



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The Decoiler was designed for winding and entire 1500m long (75 Ton) new belt. This design would help in the prejointing of new shorter length conveyor belts and then winding them up as a new belt of single length much prior to the planned shutdown.

As per the above proposal, Thejo manufactured and erected the equipments at pre-decided location over a specifically prepared civil foundation in May 2015.

Before shutdown, the three new steel cord belt rolls from the belt manufacturer were prejointed and wound onto the Decoiler. During the shut down, the old conveyor belt on the structure was cut at the tail end. While one end was led to the Coiler for winding up, the other end of the old cut belt was spliced to the new belt from the Decoiler.

On each run, 500m of old belt was wound up on the coiler, while letting equivalent length of new belting onto the structure. In such manner, within 3 similar runs, the entire belt was replaced successfully

On completion of the entire belt replacement, the two new ends of the the conveyor belt were spliced and jointed to make the conveyor belt endless.

### Conclusion

With the solution provided by Thejo, the belt replacement could be completed within 3 days, as compared to 8-10 days in the past.

