Summary

Pipe conveyors have been widely used in industry. But there is no design standard for the pipe conveyor system until now. A test rig has been built in Johannesburg, South Africa, in purpose of finding out the design parameters of the pipe conveyor. Experiments have been carried out in order to find out characteristics of the belt and to achieve some standard for designing the pipe conveyor. Besides, a numerical model by means of the finite element method (FEM) is also developed for the test rig simulation. The simulation work is presented in this report.

A FEM model is going to be built using the FEM software ANSYS. Simulation results will be obtained by solving the FEM model with the help of ANSYS. Based on the simulation results, behaviors of the belt will be analyzed. The results should firstly be not beyond the expectation. Besides, comparisons are made between the simulation and the measurements from the test rig. If the simulations are committed to the measurements, it is helpful for developing the standard. If not, it is necessary to make some analysis and find out the reason.

Simulations of behaviors of the belt include forces on idlers and deflection of the belt.

Simulation results show 1. Forces on idlers have same tendencies of that in the real measurements; 2. Deflections are committed to that in the real measurements.

With the simulation results, it can be concluded the simulation is satisfying. For further research, some aspects are recommended:

- The overlap part is crucial for the simulation results.