

**Simulation of a Coal Handling Plant**

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## **Thesis Summary**

Shortage of prime coking coal in India necessitates blending of medium to weakly coking coals with prime coking coal for the manufacture of metallurgical coke used in iron making. The blend composition affects coke quality which in turn affects Blast Furnace operations. Proper blending is, therefore, of utmost importance.

The Coal Handling Plant (CHP) of Durgapur Steel Plant (DSP) has a captive washery and its configuration requires simultaneous stocking and blending. These unique features of DSP – CHP poses additional problems for blending. An associated problem is concerned with the demurrages incurred on coal wagons detained beyond 24 hours.

The average blend proportion in the long run, is governed by the proportions of different types of coal received. Hence the CHP operation can try to achieve consistency in the blend over time. Thus blend consistency and demurrage reduction are the two main objectives of CHP. This project attempts to find out the ways and means for achieving better results w.r.t. this dual performance objectives.

Due to the complexity of the CHP, a computer simulation model for the plant has been developed. The programme has been written in BASIC and has been developed at the Computer Aided Management Centre, IIM Calcutta. After due verification and validation, the model has been used for experimentations, with a view to finding out the outcome of different actions in CHP operation and maintenance.

The results indicate that demurrage is more responsive to changes in operating performance and maintenance performance, compared to blend consistency. Improvements in operation and maintenance were found to be equally effective, so far as the improvement in demurrage is concerned. However, blend consistency could be improved only by doubling the plant performance, relative to demand; if the receipt pattern remained unchanged. Another alternative means of improving blend consistency is more synchronized receipts of coal vis-à-vis blend target. A few recommendations in this regard have also been made.