PROVIDE BF

The tides are changing
You are now in an increasingly competitive world
The customers are ever so demanding
The strictest quality specifications are in place
You have to yield maximum production from optimum consumption of material and energy

Are you prepared for the future?

Process Visualisation & Data Evaluation for Blast Furnaces

With the rising raw material prices & increasing demand for steel, an uninterrupted supply of hot metal at consistent quality and optimum cost is one of the greatest challenges for any steel plant.

Cost cutting measures & environmental concerns have made it further important to continuously improve the productivity & efficiency of blast furnaces.

The Automation Division of Tata Steel has developed a comprehensive package for Blast Furnace process visualization, simulation & control. It functions on the basis of mathematical models, graphical user interfaces, databases & communication interfaces with other systems installed in the plant.
Easy Interfacing
The system easily integrates with the existing instrumentation & automation systems in the blast furnace. It fetches the process data and executes several process models in tandem and on real time basis.

The Process Models

Burden Control
- Auto calculation of specific rate of the burden materials, coke and additives; hot metal and slag weight and their compositions.
- Auto creation of burden (stock house) matrix
- Stock House Matrix Editor - manual burden matrix

Shaft Simulator
- Displays batch wise information of the burden
  - Coke rate
  - Hot Metal rate
  - BOSH & HEARTH slag and hot metal composition
- Burden location
- Burden residence time
- Burdens of all batches between Stock-line and tuyere level

**Burden Distribution**
- Real time Simulation of
  - Distribution pattern of burden on the stock line
  - Layer formation pattern
  - Distribution pattern of Ore/Coke ratio over the throat area

**Hearth Level**
- Dynamic display of hot metal & slag levels inside the hearth.

**Mass-Energy Balance**
- Performs the mass & thermal balance of BF in real time
- Displays the location of minimum (theoretical) fuel rate and compares with the actual fuel rate in real time
- Predicts the optimum fuel rate, specific blast volume, chemical and thermal line, operating point etc. in online & offline modes (using RIST methodology)

**Stove Heat Optimisation**
- Determines the set points of fuel and combustion air supply to stoves based on
  - Stored energy level of the stove
  - Energy demand for consistent blast temperature
- Displays (Stove wise)
  - Thermal efficiency,
  - % energy utilization,
  - Axial thermal profile
Hearth Wear
- Computes the hearth lining profile using hearth thermocouples

Heat Flux
- Display of axial & radial heat flux distribution of the furnace wall
- Model considers
  - Cooling water flow
  - Water Inlet & outlet temperature of each stave

Water Ingress
- Early detection of water leakage through tuyeres

BENEFITS
- Visualization & simulation of the Blast Furnace process.
- Improvement in operational efficiency.
- Improves furnace health.
- Standardization of operations for consistent hot metal quality.
- Reduction of shutdown hours.