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Significant Reduction in Specific CO_2 Emission through Process Optimization at G Blast Furnace, Tata Steel Jamshedpur

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Abstract : One of the key corporate goals of Tata Steel company is to demonstrate Environment Leadership. Decreasing specific CO_2 emission is one of the key steps to achieve the stated corporate goal. At any Blast Furnace, specific CO_2 emission is directly proportional to fuel intake. To reduce the fuel intake at G Blast Furnace, an initial benchmarking exercise was carried out with international and domestic Blast Furnaces to determine the potential for improvement. The gap identified during the exercise revealed that the benchmark Blast Furnaces operated with superior raw material quality than that in G Blast Furnace. However, since the raw materials to G Blast Furnace are sourced from the captive mines, improvement in the raw material quality was out of scope. Therefore, trials were taken with different operating regimes, to identify the key process parameters, which on optimization could significantly reduce the fuel intake in G Blast Furnace. The key process parameters identified from the trial were the Stoichiometric Oxygen Ratio, Melting Capacity ratio and the burden distribution inside the furnace. These identified process parameters were optimized to bridge the gap in fuel intake at G Blast Furnace, thereby reducing specific CO_2 emission to benchmark levels. This paradigm shift enabled to lower the fuel intake by 70kg per ton of liquid iron produced, thereby reducing the specific CO_2 emission by 15 percent.

Keywords : benchmark, blast furnace, CO_2 emission, fuel rate
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