

ELECTRIFICATION SERVICE

## Discovering a better way to reduce faults with ABB Advisory Services

Understanding the small problems helps steelmaker to discover the big solutions



Steelmaking facilities are often reliant on aging technologies and legacy electrical infrastructure, making regular faults and failures to equipment a fact of life. Thanks to ABB, one of India's biggest steelmakers discovered how understanding and tackling the underlying issues causing these faults can solve many problems all at once.

### The challenge

Steel provides the backbone for modern industry, requiring an efficient and productive steelmaking industry to make sure that other sectors – from transportation to pharmaceuticals – can thrive. However, steelmaking plants are often found to be operating with aging assets and technologies, requiring regular interventions to keep everything running smoothly.

One of India's biggest steelmakers recently turned to ABB to find a solution for a heavy short-circuit fault at one of its plants. Its electrical infrastructure was dated, and whilst it was still capable of operating normally, it required frequent maintenance to keep everything running as smoothly as possible. Fault levels across the plant were running high and the plant's operational leaders knew something needed to change, but were unsure where to begin.

Steps were taken to upgrade the source transformer of the SMS EAF switchboard from a 80+120 MVA to a

120+120 MVA transformer. However, it subsequently emerged that the rest of the electrical infrastructure was not designed for the new setup. Short-circuit current would be higher with the new switchboard, meaning that any faults under the new system could potentially damage the switchgears and breakers, resulting in downtime. In effect, this would solve one problem, but create other problems elsewhere. Moreover, fixing the underlying issues long-term was expected to require a comprehensive redesign and upgrade of the electrical system, which the plant wanted to avoid.

### How ABB Advisory Services helped

Upon arriving on-site, the dedicated ABB Service team set out to gain a deep understanding of the plant's operations, down to the smallest technical detail of a source transformer and the nuances of every operating scenario. This would allow them not just to fix the immediate problem, but to identify and solve the underlying issues causing it, while also potentially addressing other issues across the plant at the same time.

ABB's Service team completed a short-circuit study and an application engineering study. The calculations not only revealed the wider cause behind the short-circuit faults, but that there were also far bigger wins to be achieved by modernizing some of the aging equipment, and reinforcing it for a higher short-circuit current. Crucially, this could be achieved without changing the rating of the switchgears and breakers, allowing the plant to retain much of its existing infrastructure.

#### **Outcome**

The new solution utilizes an Is-Limiter, which sits within a plant's electrical system and provides added protection. The breakers and switchgears used at the plant can withstand a short-circuit of up to 26.2 kA. If a fault occurs which would cause a power surge of above 26.2kA, the Is-Limiter trips extremely quickly. In fact, it trips so quickly that the short-circuit current can't reach its peak value and therefore never exceeds 26.2kA.

Because of the criticality of the Is-Limiter, confidence was key, and the plant needed to be able to trust the solution completely. Impressed with ABB's technology and expertise, as well as the results of the Service team's technical studies, the plant agreed that the Is-Limiter solution was the best option. The technical studies provided made it easy to justify the decision with hard data that only ABB could have provided.

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