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Avoiding costly damage to coke oven batteries: How a virtual inspection service is overcoming pandemic-induced restrictions

Coke oven batteries need regular inspection. The pandemic often prevents physical inspections. Find out how we have solved this problem.

The cost of coke as the blast furnace fuel is a significant factor in the cost of steel production. As coke ovens are expensive, it makes sound business sense to extend the lifetime of these

batteries for as long as possible. Since heating coal at 1,200° C. for up to 18 hours places great strain on coke ovens, regular inspections are needed to avoid serious damage or unscheduled downtime. But how can physical inspections be safely conducted in this pandemic?

Coke oven battery operators understand the need for regular inspection to detect any damage to the oven walls at an early stage. Deformation of mechanical parts or irregularities in the heating system are just some of the costly issues that can occur as a result of the high thermal and mechanical strains the ovens are subjected to. Besides, producing coke as efficiently as possible is one way of controlling the overall cost of steel production. Under normal circumstances, a coke oven battery will be inspected annually to detect any irregularities and maintain the high coke production levels.

At thyssenkrupp we have been involved in the coking industry for more than 150 years, built in excess of 500 coke plants, and installed twice that number of coke oven batteries. Based on this experience and expertise, we developed a Technology Service package for coke oven batteries which helps operators to optimize safety standards, equipment lifetime and plant performance, and to maximize efficiency, reliability, availability and the utilization of operational and maintenance resources. However, the prerequisite for making use of this tried-and-tested package was a physical inspection of the coke oven batteries – until COVID-19 came along. Now physical inspections have fallen victim to pandemic-induced restrictions.

To overcome this hurdle, thyssenkrupp has developed a virtual inspection service, which has already been successfully implemented in coke oven batteries across the world. A variety of data – photos, measurements, operational parameters and temperature profiles – are required for refractory and mechanical inspection and an assessment of how each oven is operating. thyssenkrupp experts then interpret these data based on their long experience of such inspections. An inspection report is then drawn up with all the findings, any discrepancies and proposals for necessary maintenance. This way, the operator knows what condition the coke oven battery is in and can initiate preventive action to prevent any further damage to the oven.

Digitalization is also making headway in the inspection of coke oven batteries. Data-driven service solutions based on a stationary laser scanning system or drone inspection enable data and measurement results to be collected precisely, efficiently and safely. Once this digital data has been analyzed, the results provide customer with a preventive maintenance service that minimizes the risk of large-scale damage and unscheduled downtimes.





Is this good housekeeping?

The bottom line: Evaluating the current status of a coke oven battery following an annual inspection allows an operator to react in good time to avoid ongoing degradation or expensive disruptions – and possible loss of production. But in the current pandemic physical inspections as the precondition for such an evaluation are often impossible. That's why thyssenkrupp has developed a virtual inspection service that enables remote analysis and evaluation of an oven's condition and a proposal for any necessary maintenance.
