Reliability Project Case Study

Coker Gantry Crane Reliability

Investigate, Design, Manage Approach to Correct Gantry Crane Wheel Bearing Failures

Brindley has been called upon to investigate several gantry cranes in Delayed Coking Units at industrial facilities across the United States. A common problem is premature wheel bearing failure caused by improperly designed or maintained rail systems and the structures that support them. This leads to rails that are too flexible, causing the cranes to deflect excessively and wear the bearings. Reliable operation of Coker gantry cranes is critical to the operation of these high-value units.

BE the Solution

Special investigation techniques were used to determine the depth of coking oil ingress into the concrete, which is critical for scope determination, detailing, and construction execution. Bearing plate design with proper grout selection and installation details to avoid cracking and heaving ensure that the high point loads under the rails can be accommodated while resisting coke fine ingress and acid attack to ensure a long service life. Rail hold down supports need to be designed to accommodate the thermal loads, point loads, and horizontal loads imposed by the crane yet need to work with the bearing plate and grout design to ensure reliability. Specialized thermite welding of the rails is needed due to the materials of construction and to improve crane operations.

Our Challenges

Delayed Coking Units operate in very harsh environments involving high heat, cyclical loading, abrasive and corrosive materials, and restrictive maintenance windows due to operational safety concerns, causing maintenance activities to take place primarily during unit outages. We often discover original designs and standard maintenance procedures that do not adequately address the difficult environment the unit is subjected too. Common problems include not accounting for the high point loads from the crane, improper rail attachment and support detailing, and poorly selected materials that cannot resist the loads and unique operational environment. Material selection and detailing become even more critical in order to achieve a reliable repair that can be conducted without impact to the overall turnaround window.

BE the Result

Reliable infrastructure that is critical to on-stream efficiency of a process unit is a key to facility profitability. Brindley focuses on the evaluation and repair of existing infrastructure and has a unique combination of knowledge and experience with material selection, constructability, and turnaround execution.

Contact Us

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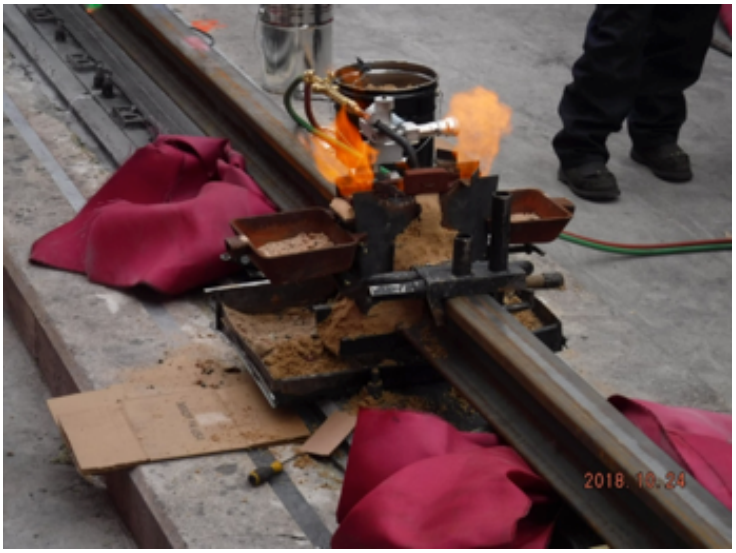
Typical View after Rail Removal



Thermite Welding

Example Completed Rail System

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