BSE
BADISCHE STAHL-ENGINEERING GMBH

Excellence Story

From the Concept to the Implementation

Dedusting revamping of two 150t DC twin-shell furnaces at Dragon Steel Corporation, Taiwan

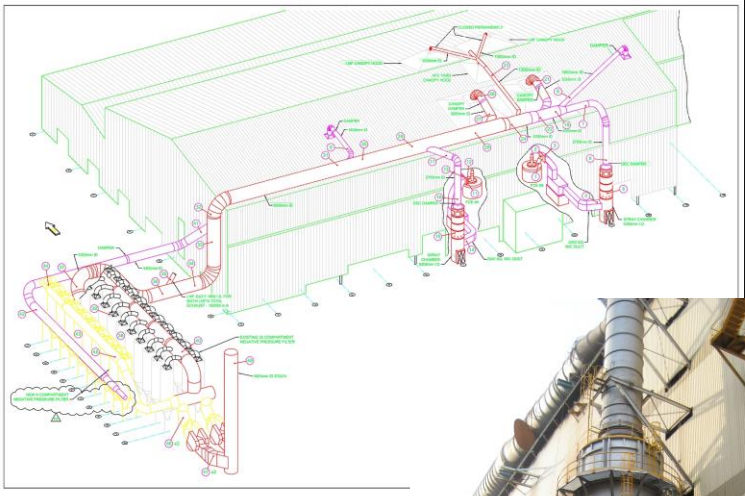
Beginning of 2005 Dragon Steel Corporation awarded BSE/BCI with a Fluid Dynamic Modeling of the existing melt shop and with a Conceptual Engineering Study of the entire emission control system. In 2008, BSE/BCI came along with them again to implement the concept.

FLUID DYNAMIC MODELING

Dragon Steel main motivations were to improve the in-shop air quality for the furnace and ladle furnace areas of the melt shop building and to adapt the Direct Evacuation Control (DEC) system to future production requirement with hot metal charging and to comply with environmental regulations becoming more and more stringent.

A Plexiglas model replica was built including all main equipment having an influence on the in-plant environment: dust sources like furnaces, ladle furnaces, alloy feeding system, heat sources like slag, ladles, tundishes, caster, but also the design of the canopy hood, scavenging ducts, or bay openings.

Several tests simulating all kind of operating conditions, such as charging hot metal and scrap, tapping, O2-blowing, etc were conducted to predict the required exhaust capacity and the necessary modifications at the building geometry, canopy hoods to achieve zero emissions from the melt shop at the lowest cost and with minimum shut down time.



CONCEPTUAL ENGINEERING

Based of the furnace operating practice, the expected heat release from the furnaces to the Direct Evacuation Control (DEC) system was established by using in-house computer programs. The DEC system requirements were then balanced against the Secondary Emission Control (SEC) and ventilation criteria determined by the Fluid Dynamic Modeling in order to arrive at the necessary flow conditions.

The time of the heat cycle with the highest demand on the emission control system (worst case) was determined and was the basis for the design of the future emission control system. The results of the Conceptual Design were presented on a comprehensive process flow diagram showing the existing and future arrangement of the emission control system.

IMPLEMENTATION

Following the conceptual engineering phase, Dragon Steel decided beginning of 2008 to implement the proposed modifications at the emission control system. BSE supplied detailed engineering drawings of the water cooled and dry ducting and delivered the High Temperature Quenching system with latest dynamic water control feature.

RESULTS / SUCCESS

The first twin-shell furnace was commissioned in June 2009. After having optimized the operation at the first installation, the second twin-shell furnace went on-stream very smoothly in September 2009.

- The emission control system keeps running well.
- The HTQ system is easy to maintain.
- The dioxin / furan values are far below the governmental threshold values.

"*This is the most successful project we ever experienced*"
Mr Chi-Wei Tai / General Superintendent Steel Making

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