SUPPLY AND INSTALL AN SCR SYSTEM TO OPERATE WITH EXISTING HRSG

BOILER CASE STUDY

Ingredion
(formerly Corn Products)

Stockton, California

SCR System

CUSTOMER APPLICATION AND KEY CHALLENGES

Ingredion is a world-leading ingredient solutions provider; turning corn, tapioca, wheat, potatoes, and other raw materials into a myriad of ingredients for the food, beverage, brewing, and pharmaceutical industries as well as numerous industrial sectors. With more than 10,000 employees worldwide, Ingredion serves customers in more than 60 diverse markets while remaining committed to supplying their customers with innovative ingredient solutions that are on-trend and in demand.

Ingredion's Stockton processing plant is equipped with a gas turbine and cogen Heat Recovery Steam Generator (HRSG) that recaptures exhaust to generate electricity for the plant. Ingredion was interested in a new SCR system to reduce their NOx emissions from this process to below 9 ppm. Having used R.F. MacDonald Co. as a reliable provider of knowledge and service for their NOx-related issues in the past, Ingredion turned to R.F. MacDonald Co. once again to assist with their current SCR needs.

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your boiler & pump solutions team
~ since 1956

Ingredion is one of the world's leading ingredient solutions providers

THE R.F. MACDONALD CO. ANALYSIS & SOLUTION

There were several challenges facing R.F. MacDonald Co. when they began planning how to integrate an SCR system into Ingredion's existing cogen HRSG. The first challenge was obtaining the proper documentation, specifications, and measurements of the existing equipment to properly design a compatible system that would operate both safely and efficiently. The next challenge was disassembling the HRSG structure and removing the components, which involved multiple crew members and the utilization of a crane to carefully lift the parts out of the housing without damaging the equipment or steel structure. Finally, the new SCR system had to be integrated with the components and reinstalled into the HRSG housing.

As a complete system integrator, R.F. MacDonald Co. was responsible for supplying the equipment at every phase of the installation. The Haldor Topsøe catalyst SCR system was controlled with Allen-Bradley PLC based touchscreen controls, which were designed by our in-house staff specifically for SCR applications.

The Aqueous Ammonia skid for the installed SCR system

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The installation of the SCR system needed to be constructed within the existing metal frame so cranes were used to drop the equipment into place from the top of the structure

R.F. MacDonald Co. also supplied the SCR reactor housing and injection hardware, as well as handled the construction and commissioning services. On the ammonia side of the SCR system, R.F. MacDonald Co. recommended an aqueous ammonia system, which stores the ammonia in a water tank to reduce the hazardous impacts on site, and vaporizes the ammonia into a pure state when it's needed for use in the SCR system.

"As a complete system integrator, R.F. MacDonald Co. is in a good position to offer single source responsibility to our customers - even on large and complex projects."

PROJECT RESULTS

The commissioning process went smoothly. After a few minor instrumentation adjustments, the customer passed their source test. The new SCR system achieved NOx emission levels of 5 ppm, well below the initial goal of 9 ppm. In addition, the customer wanted to expedite the installation to minimize the turbine downtime and maintain plant operations. Committed to a 72 hour turnaround, R.F. MacDonald Co. completed the project in just 48 hours.

On multi-phased projects like this, the strong team of sub-vendors and in-house expertise that R.F. MacDonald Co. offers is indispensable to the success and reliability of the project.