Application of SNCR to Reduce CO Boiler NOx Emissions

David K. Moyeda
GE Energy, 1831 E. Carnegie Avenue, Santa Ana, CA 92705
E-mail: david.moyeda@ge.com; Telephone: (949) 794-2616; Fax: (949) 475-0471

Wei Zhou
GE Energy, 1831 E. Carnegie Avenue, Santa Ana, CA 92705
E-mail: wei.zhou@ge.com; Telephone: (949) 794-2628; Fax: (949) 475-0471

Quang H. Nguyen
GE Energy, 1831 E. Carnegie Avenue, Santa Ana, CA 92705
E-mail: quang.nguyen@ge.com; Telephone: (949) 794-2632; Fax: (949) 475-0471

Summary

CO heaters are used in the refinery industry to process off gases from fluidized catalytic cracking units (FCCU). These off gases generally contain high levels of carbon monoxide (CO) and trace nitrogen species that can be converted to NO_X. Selective Non-Catalytic Reduction (SNCR) can be applied to effectively reduce NO_X from CO heaters and other industrial combustion systems. Design tools, such as computational fluid dynamics (CFD), can be used to optimize SNCR system design and performance to account for the sensitivity of the chemistry to temperature and CO concentrations. CFD is useful for understanding the characteristics of the combustor flow field and gas temperature and species distributions. It can be used to support the development of a reagent injection system design that good mixing and distribution of the reagent with the furnace gases. This presentation presents the results of an application of SNCR to a CO heater. Testing with the installed SNCR system demonstrated well over 30% NO_X reduction and less than 10 ppm ammonia slip.