Boiler Tuning for Emissions Compliance

Problem:

An international chemical company needed to reduce NOx/CO emissions on their package boiler to meet state permit limits

Unit Description: D-type package boiler, 120 kpph saturated steam flow, with a single natural gas fired burner.

Solution:

After assessing the current performance, STEP conducted a boiler tuning program to optimize performance of the existing equipment and evaluate the need for hardware and/or tuning adjustments.

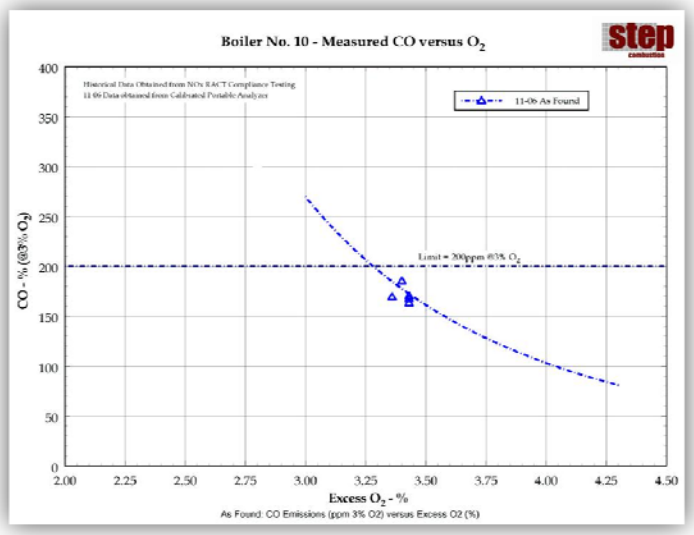

Figure 1 - As Found CO Characteristics

Results:

Figure 2 - Burner Flame

Through burner adjustments and operating changes STEP was able to reduce CO and excess O2 operation (accordingly, NOx emissions) below the permit limits. Furthermore, STEP discovered that the cause of the increase in CO emissions was both an improperly fit flame stabilizer and recent changes to the burner throat geometry.

Tuning and field adjustments were sufficient to reduce emissions within permit limits. Throat geometry and flame stabilizer corrections were applied to complete the long term solution.

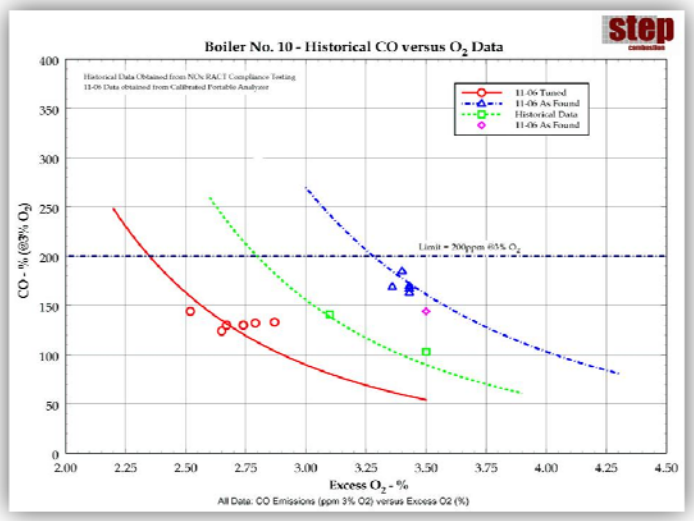

Figure 2 - Optimized/Tuned CO Characteristics