



REDUCTION OF THE CO EMISSIONS OF A OIL FIRED PFRK

Context

Our customer operates a 450 tons per day Parallel Flow Regenerative Kiln (PFRK) fired with recycled oil. The use of the fuel led to high CO emissions which needed to be reduced in order to comply with the environmental permit requirements.

Proposed solution

EESAC started the study with a detailed analysis of the kiln emissions along the cycles of the PFRK as displayed in Figure 1.

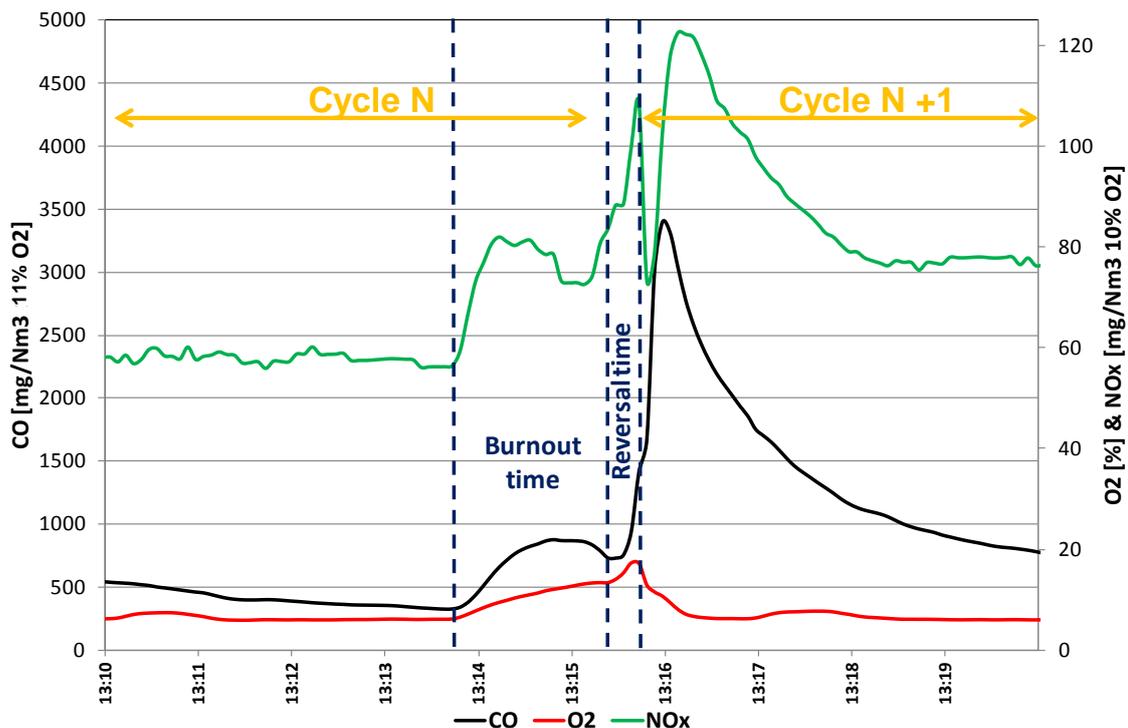


Figure 1: Detail of the emissions during kiln reversal

The interpretation of the above signals indicated that the CO emissions of the kiln were coming from unburned fuel in the preheating shaft. On this basis, EESAC has developed a test protocol including various potential solutions to reduce the CO emissions of the kiln. Those solutions included:

- The fuel injection mode during the kiln burning cycle.
- The air injection mode both in the burning shaft and in the preheating shaft.
- The co-firing of the oil with a fuel which has a better burning capacity.

The testing period lasted 4 days. EESAC steered the tests in cooperation with the plant staff.



During the tests, the kiln gas was monitored in the connecting channel of the kiln and at the stack, in order to follow precisely the burning conditions prevailing inside the kiln shafts.

Results

All the potential reduction measures led to a decrease of the CO emissions. Those emissions were reduced by up to 25%, depending on the kiln conditions. However these clearly highlighted that several reduction measures could be applied in combination with each other's and could therefore lead to a higher decrease of the CO emissions of the kiln. It is therefore planned to lead additional tests to assess the CO reduction obtained on this kiln, on a long perspective.