Ultra-High Voltage Energization of Electrostatic Precipitators for Coal Fired Boilers
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Abstract

Strict air pollution control are today high on the agenda world-wide. China is now leading the way towards zero emission as the high concentration of power plants and the size of these, demands very low particulate emission. In US the implemented MATS regulation has demanded low emissions and with the new BREF regulation in EU, particulate emissions from power plants is now to be in the range of 2-14 mg/Nm3.

In order to reach such low emission levels, it is required to have a well functioned electrostatic precipitator (ESP) as well as FGD system. Many of the existing ESP’s are initially designed for much higher emissions and thus in a need to have the efficiency improved.

FLSmidth has the required technology for improving existing ESP’s to reach ultra-low emissions. To do so, it is required to catch also the fine particles – including PM2.5.

The solution is to replace existing high voltage energization systems with micro-pulse system. Traditional T/R sets and High Frequency (SMPS) systems are all limited by spark levels inside the ESP’s as well by back-corona. This can be counteracted by a micro-pulse system – which often can double the voltage level between the electrode systems and thereby also double the migration velocity. This then leads to a significant increase in efficiency.

The FLS micro-pulse system is called COROMAX® and it also has the ability to lower the power consumption as well as being able to catch the PM2.5 particles and other hazardous small particles, like mercury.

An ESP powered by micro-pulse system will be less sensitive to burning different coals and hereby gives more freedom to operate the plant. The ultralow emission of particles will improve the operation of the WFGD system, as there will be less wear on pumps and agitator, cleaner waste water and gypsum.

The great advantage of the COROMAX® system is that the emission can be improved without the need to change the internal parts or enlarge the ESP. Recently, more than 200 units have been installed, where emissions have been reduced to levels as low as 5 mg/Nm3.

Keywords: Air Pollution Control, Fine Particles, Micro Pulse Technology, ESP upgrading