

Boiler Condensate (Flow Accelerated Corrosion)

Background

The measurement of particulates in boiler condensate has traditionally required the use of a sample conditioning system to bring the condensate within the working pressure and temperature range of the particle counting instrument. Sample conditioners that reduce the sample fluid's temperature and pressure can have a dramatic affect on particle size and count as the fluids are no longer representative of real process conditions. InVA (**I**ndustrial **V**isual **A**nalyzer) with its unique ability to analyze particles online and at high pressures and temperatures, without the need for any prior sample conditioning; was able to see the actual particle size and loadings present in the boiler water directly from the boiler-water feed, revealing the real extent of fluctuations throughout a typical 48 hour period.

Results

The data presented in this case study was part of an extensive Flow Accelerated Corrosion study conducted at various power stations in the United States. Figure 1 shows the particulate concentration and it can be observed that there is a cyclical pattern. This is seen to rise around 6pm and fall around 10pm and similarly rise and fall between 6am and 12pm on both days. These concentration peaks correlate to when the power plant reaches its peak load. This similar cyclical pattern is repeated for the particle mean size, shown in Figure 2; with the particle sizes decreasing by almost 50% during off peak power plant activity.

Conclusions

Online data of this nature allows the power plant to develop an assessment of the actual solid particles present in the boiler water and therefore determine their most effective treatment regimes. The data is invaluable to understanding corrosion particle transport within a power plant. These results clearly show the benefit of installed InVA technology for the monitoring and management of boiler condensate providing an early warning of process changes.

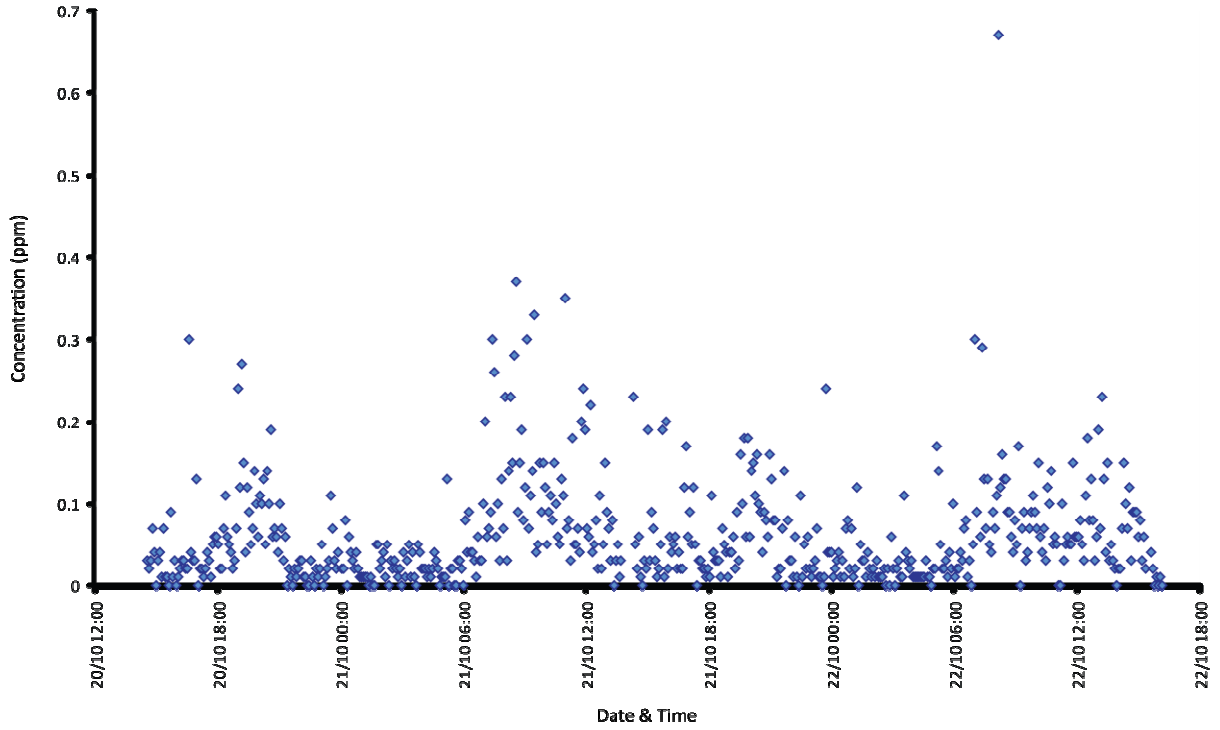


Figure 1: Average particle concentrations in the boiler water feed

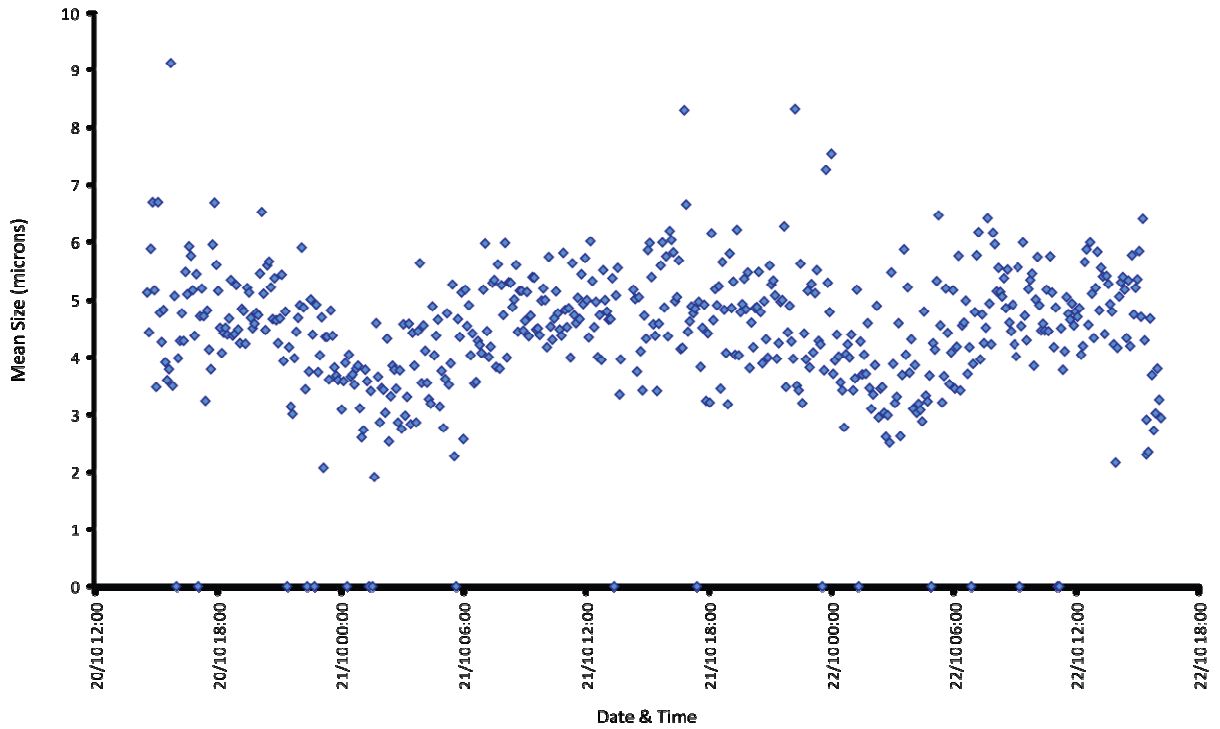


Figure 2: Mean particle size in the boiler water feed