



# XRF Steel Plant Off-Gas Monitor

## THE PROJECT

The project required the development of a prototype X-ray Fluorescence (XRF) device to measure the relative quantity and composition of dust in the off-gas system of a BOS plant.

XRF is a process by which an X-ray beam is projected into an area causing photons to be emitted from atoms they interact with. These photons can be detected, and their characteristic frequencies can be used to identify the atoms present.

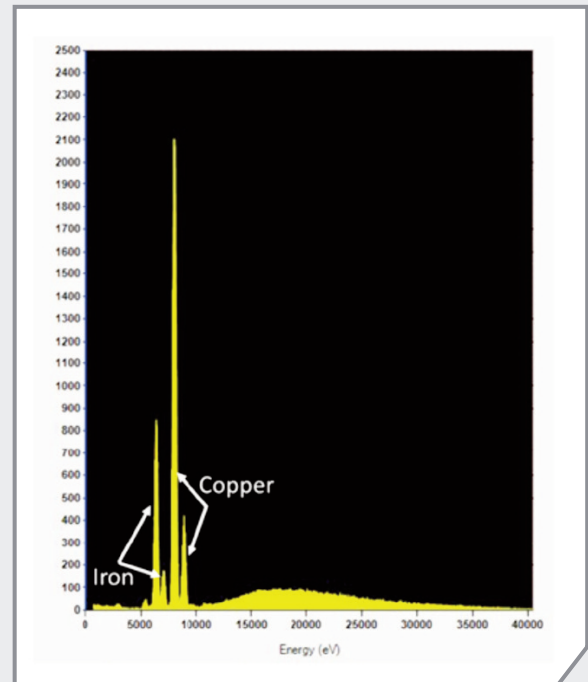
## COMMISSIONING AND TESTING

XRF components were installed to the internal area of the water-cooling housing and following commissioning the first tests were carried out using solid steel and copper samples. These tests proved that the system operated correctly and provided peaks in the spectra at the expected energy levels.

Once identified these peaks can be used as a calibration to quantify the energy levels of other peaks and thus can be used to identify other elements.



Modified water-cooling housing with XRF internal components installed



XRF spectrum showing iron and copper peaks

Additional tests have been carried out using simulated samples prepared from BOS dust. Dried and ground dust was coated onto an adhesive sheet to simulate a dust cloud. Initial indication shows a difference between spectra obtained with different dust concentrations.

## NEXT PHASE

The next phase of development will be to install and test the system on the fume extraction system of the electric arc furnace in the Institute's Normanton Plant.

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