

## EXTENDED ABSTRACT

**Title :** The Personal Exposure Cost of Keeping the Lights On! An evaluation of exposure to respirable crystalline silica and respirable dust for Coal Fired Power Station fabric filter workers.

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**Objectives:** The objective of the study was to assess worker exposure to respirable dust (RD) and respirable crystalline silica (RCS) contained in fly ash dust during the removal of fabric filter bags and excess fly ash within the Fabric Filter Cells at a coal fired power station.

**Methods:** Personal exposure monitoring for RD and RCS was conducted on workers completing cell removal tasks. Gravimetric analysis was used to determine RD total concentration and x-ray diffraction (XRD) for RCS total concentration, reducing the potential of interference from non-crystalline forms of silica. A qualitative questionnaire survey was used to evaluate the worker's knowledge of adequate controls and the health risks associated with RD and RCS.

**Results:** Total concentration ranges of 0.22 mg/m<sup>3</sup> to 25.37 mg/m<sup>3</sup> for RD and 0.01 mg/m<sup>3</sup> to 1.49 mg/m<sup>3</sup> for RCS were measured during the removal work. Statistical analysis identified a UCL value of 30.46 mg/m<sup>3</sup>, a 95<sup>th</sup> percentile value of 21.53 mg/m<sup>3</sup> for RD and a UCL value of 0.94 mg/m<sup>3</sup>, a 95% Percentile value of 1.03 mg/m<sup>3</sup> for RCS.

**Conclusions and Recommendations:** Results indicate a potential for workers developing chronic diseases such as silicosis and Chronic Obstructive Pulmonary Diseases. The use of compressed air was identified as a major contributing factor to high concentration results and as a priority an alternative method is recommended. Survey data identified that Respiratory Protective Device education and fit testing had not been provided and needed to be implemented. Ongoing personal monitoring is required to validate the adequacy of new controls when implemented.

**Key Words:** fly ash, crystalline silica, respirable dust, coal fired power station, fabric filter, x-ray diffraction, silicosis, chronic obstructive pulmonary diseases, respiratory protective device.