

# Emission Control Laboratory

## Introduction

The Emission Control Laboratory was established in 2001. After 2003, the institute became a non-profit and fully self-supported research institute by being awarded many contracts and research projects from both private and governmental organizations. The main objective of ICSET is to connect real world technologies with an academic research environment. Its revenue is primarily contributed to provide fellowships and assistantships for WKU students, visiting scholars, and foreign outstanding researchers, and to purchase instrumentation. Since 2001, the ICSET Mercury Emission Control Laboratory has been contracted by several major utility companies to perform field tests in an effort to help those companies determine the amount of mercury emitted and identify the mercury speciation within their existing control processes. There have been 80 boiler units with various types of air pollutant control device configurations tested over the past four years.

Based on the past field testing experiences, the Emission Control Laboratory sampling and analytical team has decided to step forward to provide the U.S. power industry a more comprehensive service in 2005. The Emission Control Laboratory has contracted to acquire several sets of appendix K analytical and sampling instrumentation which are the most up-to-date models available. This additionally improved capability will enable the testing team to perform both the appendix K sampling and on-site analyses. Furthermore, within the existing RATA trailer, the testing team has intergraded the mercury and HCl monitoring capabilities. Based on these innovative improvements, the customers will be able to obtain a complete, representative, and accurate view concerning various air pollutants in the flue gas, thus facilitating their compliance strategy processes.

## Instrumentation:

- Isokinetic source sampling equipment
- Appendix K sampling equipment
- Semi-Continuous Mercury Emission Monitors (SCEM) and sample conditioning module (Tekran/PSA)
- Leeman Hydro Autodigester & Analyzer (AA)
- Millennium excalibur system (AF)
- OhioLumex RA 915+, mercury zeeman spectrometer with M-324 attachment set for stack gas sorbent tube, ash and coal testing and RP91C Attachment for field ash and soil testing
- LECO AMA-254 advanced mercury analyzer
- API Model 360E gas filter correlation CO<sub>2</sub>/CO analyzer
- API Model 100EH fluorescent SO<sub>2</sub> analyzer
- API Model 200EH Chemiluminescent high level NO/NO<sub>2</sub>/NO<sub>x</sub> Analyzer
- Photoacoustic Multi-Gas Analyzer (INNOV 1312), IMR 5000 Multi-Gas Analyzer



## Capabilities:

- Wet Chemical Method sampling at 8 locations simultaneously for: NO<sub>x</sub>, Hg, HCl/HF/HBr, SO<sub>2</sub>/SO<sub>3</sub>, Trace Metals, or NH<sub>3</sub> slip
- SCEM Hg sampling at 6 locations simultaneously
- Appendix K sampling at 2 locations
- Coal, Ash & FGD sludge analysis
- SCR Catalyst Slip Stream Testing Module
- The 53-foot mobile Hg Emission Monitoring Laboratory enables sampling and analytical processes onsite, drastically reducing the delay between data turn-around time
- Relative Accuracy Test Audit (RATA)
- Corporate environmental strategy consulting

## Experience:

- Ten years of research experiences with fossil fuel combustion processes
- Eight years of research experiences involving emission controls
- Five years of experiences with combustion modeling and simulation
- Four year of field testing experience on Hg speciation, emission
- and control with various coal types and over 100 different boiler/unit
- and APCD configurations
- Four year of Corporate environmental strategy consulting experiences
- Three year of activated carbon/sorbent injection projects
- Research coordination and evaluation experiences

# ICSET EXTENDING SERVICES THROUGHOUT THE NATION

