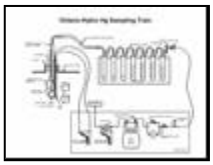
Tip of the Week

March 28, 2005



Successful Mercury Testing

With EPA's Clean Air Mercury Rule looming over utility boilers, we can expect to be doing a lot of mercury testing in the next year or so. Utilities will be particularly interested in understanding how the different forms of mercury change as the flue gas passes through existing air pollution control equipment. A mercury mass balance around the plant and each individual control device will become a standard request. This may involve not only simultaneous gas sampling at five or more locations, but extensive fuel and ash sampling as well.

The Ontario-Hydro method published under ASTM-D6784-02 is currently considered the "standard" for speciated mercury measurements. This method has few known biases when determining total mercury concentrations. However, there are some well-documented biases in the method's ability to speciate mercury in high dust loadings (e.g., inlets) and at entrained moisture locations (e.g., scrubber outlets). Here are a few tips to reduce these biases, as well as some more general tips to help ensure a successful mercury testing program.

- In high particulate loadings, use the in-stack filtration option. This will help reduce the contact time of the gas and the particulate matter, and hopefully reduce the potential adsorption or catalytic oxidation of elemental mercury.
- In a flue gas saturated with moisture, water droplets in the nozzle and probe may affect the oxidation state of the mercury. The following actions are recommended after wet scrubbers:
  - Point the nozzle opposite the flow. The resulting sub-isokinetic sampling will reduce the capture of larger water droplets. Since PM is expected to consist of relatively small particle sizes in these locations, the error on the particulate capture should be minimal.
  - Heat the probe to 350°F to ensure complete re-vaporization of any water droplets.
- Do not start a test series until the plant is at steady state. Allow at least 2 to 3 hours after any process changes for line-out of plant conditions.
- Plan for a good & complete coal and residue sampling program (see example).
- Coordinate solid sampling with gas sampling.
- Pay attention to soot blowing cycles.
- Consider installing a continuous O_2 monitor on each meter box exhaust.
- Make sure the laboratory understands that the samples must be analyzed within an hour of digestion. Otherwise, low mercury recoveries may result.
- For coal and ash mercury analysis, use ASTM D6722, which is a direct combustion method. Other methods such as ASTM D6414 and D3684 are indirect and not as accurate.