



Do You Hear What I Hear?

As in any competitive market, rumors and un-truths run rampant. The mercury CEMS market is especially embattled because the technology is new to domestic Utilities and the timeline for the decision making process is compressed. Tekran provides you the following to help clear up the mystery behind continuous mercury monitors (CMMS) and the Series 3300.

1. How low can CMMs measure mercury concentrations accurately?

Be aware of the difference between the analyzer and the method detection limits when evaluating technologies, as some suppliers attempt to blur this line so they can claim lower detection limits. The Tekran analyzer, the Model 2537A, has a sensitivity or Instrument Detection Limit (IDL) of less than 0.1 ng/ m³ or ppt level. The Method Detection Limit (MDL) for the Tekran Series 3300 Mercury CEMS is < 0.05 ug/m³ based on the standard 30:1 dilution performed at the sampling probe. Also note that Tekran has routinely measured the stated low-levels in the field with our standard system configuration, while others cite special conditions, such as the use of nitrogen and controlled environment factory tests, when making detection limit claims.

2. Why are carrier gases, like Argon, used in mercury analyzers?

To achieve maximum sensitivity, carrier gases are used in AF detection to provide an inert atmosphere for analysis, preventing interference of the signal (quenching) by other stack gas constituents. The use of argon is necessary to achieve Tekran's advertised MDL, as the air needs to be evacuated from the sample detection cell during analysis. This process is critical because O₂, SO₂, and NO_x absorb light at the same wavelength as mercury, 253.7 nm. Other vendors (see question 1) admit to using a carrier gas, such as nitrogen, when performing low-level measurements. Interestingly enough, EPA studies show that although nitrogen provides a better analysis matrix than air, it is still 8 times less sensitive than argon.

3. Do CMMs produce hazardous waste?

As applied to stack gas sample conditioning, Tekran uses only 3 to 5 L of DI water per day to scrub the sample. Analytical data that has been reviewed to date, has shown that the resulting scrubber wash water waste from the Tekran Series 3300 is well below any level of regulatory concern and under normal conditions, can be disposed of on-site. This is due to the low levels of hazardous materials in the stack gas to begin with, coupled with the 30:1 dilution conducted at the sample probe. Other vendors scrub contaminants using a solid converter core and a dry scrubber canister, which can lose scrubbing

efficiency over time as they become saturated. Additionally, when these two components are changed, at the recommended six month interval, they contain a concentrated, solid, hazardous waste that must meet Land Disposal Restrictions (LDR) and therefore cannot be treated or disposed of on-site.

4. What measurement techniques are used in CMMs?

As stated in the 1st Edition of the Tekran Newsletter, Mercury Today, Tekran uses argon, CVAFS, patented pure-gold traps, and scrubbing in concert to provide the absolute optimal sensitivity and selectivity to mercury in the complex stack gas matrix. As stated earlier, concrete scientific data has proven that argon yields an 8X greater sensitivity to mercury by AF than nitrogen, and approximately 30X greater than air. These techniques have been proven for over 30 years in the mercury measurement field.

5. How many Tekran Series 3300s are in operation?

Tekran's first commercial Series 3300 was installed in 2003 and is still in operation. To date there are 35 Tekran Series 3300 Mercury CEM systems in continuous operation, and this number is growing monthly. Tekran is successfully operating and routinely passing RATAs under a wide variety of stack conditions (wet scrubbers, SCRs, stack heights >1000 ft., etc.) and coal types (Eastern Bituminous, Powder River Basin, Lignite as well as a variety of blends).

6. Have any CMMs been certified under the current regulatory requirements?

Yes. Tekran is pleased to announce that the Series 3300 has been certified on more than one occasion under the current USEPA Part 75 and PS-12A requirements. In fact, Tekran is the first mercury CEMS to report data and be certified for compliance monitoring in the US. At one major utility in the southern U.S., Tekran passed RATA certification on two systems on the first attempt.

7. How long can the sample umbilical be for CMMs?

Tekran has umbilical lines up to 1100 feet, with response times typically around 9 minutes for this length. Technically, the only limitation to line length would be a minimum instrument response time requirement, as detailed in the regulations. Additionally, unlike other vendors, Tekran does not have issues with sample recombination in long lines because all of Tekran's conversion technology is located in the rack instead of at the probe. This feature benefits both system performance and maintenance requirements.

8. Can the Tekran Series 3300 speciate?

Yes, and has been doing so in the field since the commercial release of the equipment in 2003. The Tekran Series 3300 uses the simplicity and genius of the solubility properties of elemental and ionic mercury to produce two distinct analysis streams, thereby by



achieving 100% efficient speciation and elimination of the chance of recombination of species. Unlike other vendors, we can show speciation data from actual field trials. Additionally, Tekran employs proven calibration standards, incorporating NIST approved techniques and standard reference materials. The Tekran model 3310 and 3315 generate both mercury species in order to challenge the analyzer response and converter efficiency as required in the EPA System Integrity Checks.

9. How do Tekran probes perform on wet stacks?

Performance in wet stacks has been a challenging issue for all manufactures of mercury CEMS. Bottom line, Tekran has shown successful operation and routinely passes RATAs at plants with wet stacks using our current product offering. Modifications and improvements will continue to be made to enhance the performance of Tekran probes in wet stacks, including a two piece design of the probe flange and stinger, sample flow path simplifications, increased use of surface coatings including Teflon, and the new heated manifold block. These improvements have been shown to be successful at variety of wet stack sites including the Trimble County Site. Tekran offers our product enhancements to our customers in an upgrade policy that is not limited to six months like our competitors. Additionally, Tekran is releasing its second generation of CMM probes in the first quarter of 2007. The new model 3332 incorporates all lessons learned over the past three years and includes a smaller footprint and simpler maintenance procedures.

10. How will Tekran meet the demand for to supply and service the CMMs market?

Tekran Instruments Corporation is currently implementing plans to address the aggressive growth of the mercury CMM market. Series 3300 CEM module production has been shifted to TSI's state of the art production facility in Shoreview, MN and capacity can easily be increased to meet the estimated market demands. The Knoxville, TN service and support facility is undergoing upgrades to support system test-out, QA/QC, training and remote service. The field service staff has grown by 150% since the program inception, and is on track to grow an additional 150% by the first quarter of 2007. Work is on-going to coordinate spare parts inventory with on-line ordering capability, as well as coordination with several nationwide regional systems integrators which will maintain a spare parts inventory as well as coordinate installation and service.

11. Will Tekran be able to provide support for the Series 3300 for the next ten years?

Tekran Instruments has been in operation since 1989 and is the world leading provider of continuous mercury monitors for ambient and emissions applications. There have been rumors that after the CMM market peak, Tekran will be dismantled like one of our sister companies, ESC. The fact is that ESC was not dismantled. ESC refocused on its core competency of Part 75 Data Acquisition Systems and Software. Although misunderstood by many, the decision was made in order to ensure cutting edge software products and high-level customer service for the DAHS market. And in fact, after 37 years in



existence ESC still maintains over 60% of the market share in the coal-fired utility arena. Following the same model, Tekran Instruments will continue to focus on its core competencies of mercury science and continuous mercury monitoring products. Tekran entered the CMM market because we have technology that has proven itself over the last 17 years. Unlike some major competitors, Tekran has not tried to force untested mercury technology into NOx and SOx boxes, just to meet the fast approaching demand of the CMM market. Furthermore, the combination of our proven technology with the manufacturing capabilities of our parent company, TSI, has created a dominant force in the market that is more than prepared to provide Tekran products and services to the entire utility industry.

Additionally, Tekran is already finalizing development of our second generation of CMM technology for coal-fired applications. Improvements include simplified maintenance, smaller footprint designs, a single electronics platform for all components, and enhanced diagnostic software capabilities. Tekran is also growing its internal service department and has been working with leading CEM service providers to ensure quality support for the life of the equipment.

For the future, Tekran is involved in several exciting areas in the mercury field.

Currently, a modified Series 3300 mercury CEMS is involved in a number of studies determining the viability of an instrumental reference method. Tekran's performance has been very promising and will keep us active for many years to come. Tekran also offers a continuous mercury monitoring system for ambient air quality. This system is based on the model 2537A CVAFS analyzer, which is also used the Series 3300 CEMS.

Currently, Tekran has over 250 ambient systems in operation all over the world, with installations ranging from arctic regions to the middle of the desert. All indications point to an increased domestic market for ambient mercury monitoring in response to CAMR and Tekran will be ready to serve.

