AECOM

Helping You Achieve MATS Compliance through Strategically Optimized Solutions

AECOM's Strategically Optimized Solutions for MATS Compliance

AECOM can help you optimize your MATS compliance strategy—saving you money and increasing performance and reliability of your mercury control system.

Is complying with mercury emission limits more costly than anticipated?

Are you experiencing periodic excursions in mercury emissions?

Are you running closer to the emissions limit than you would like?

Is the operating flexibility of your plant limited by its mercury control strategy?

Our Strategically Optimized Solutions (SOS) for MATS compliance put your existing pollution control systems to work to maximize mercury oxidation and removal—and save you money. AECOM can reduce operating costs, increase mercury control system reliability, and improve the flexibility of plant operations. We strive to take full advantage of low- or no-capital cost options.

Reduced operating costs

AECOM has reduced sorbent and additive costs at some plants by 10-20%. AECOM has helped plants achieve MATS compliance without activated carbon injection (ACI) or halogen additives, thus eliminating the operating expense altogether.

Increased reliability

AECOM can obtain more reliable mercury removal performance for your plant by strategically modifying the operation of your existing air pollution control systems.

Increased plant flexibility

Flexibility will enable you to cycle load as needed, avoid derates, burn various fuel types (including those with high and variable mercury concentration), address seasonal compliance issues, and position your plant to be ready for future regulatory requirements.

AECOM can quickly analyze your MATS situation, propose and demonstrate a solution, and implement the solution.

AECOM leverages unmatched industry experience to address the root cause of your problems. First and foremost, we rely on our in-depth knowledge of power plant pollution control systems, including mercury controls, selective catalytic reduction (SCR) and flue gas desulfurization (FGD). Our engineers and scientists have hands-on knowledge with the entire spectrum of mercury control issues and decades of power plant air pollution control experience.

AECOM takes a holistic approach to compliance. We understand that mercury emissions reduction is one piece of a complex regulatory obligation, so we take a holistic approach that considers the implications of your mercury control technology choices on your ability to meet pending environmental regulations. For example, AECOM will tailor your MATS compliance approach to better position the plant for future compliance with Effluent Limit Guidelines (ELG) and other compliance or emissions targets. AECOM has experience in designing and providing solutions which have beneficial effects on mercury, selenium, and halogen concentrations in wastewater.

AECOM takes a data-centered approach to compliance. Our attention to detail enables us to collect accurate data, correctly diagnose your problem, and propose efficient solutions. AECOM serves as a technology-neutral, third-party consultant to determine the viability of emerging technologies.

How does AECOM deliver solutions?

Analyze your situation

- Talk with you to understand the problem
- Review unit configuration, operating data, and mercury emissions data
- Conduct a site visit, if necessary
- Collect and analyze plant samples for a diagnostic mercury mass balance

Propose a solution

- Work with your existing air pollution and mercury control systems
- Find solutions at no- or low-capital costs
- Find solutions to reduce operating costs
- Build in a "comfort level" of mercury compliance and operational flexibility

Demonstrate the solution

- Design a test program to demonstrate operational approaches without adversely affecting compliance with the 30-day average for mercury emissions
- Quickly mobilize to commence on-site testing of new solutions
- Deliver demonstration equipment
- Perform mercury measurements

Implement the solution

- Develop the detailed design of commercial systems, either independently or in conjunction with OEMs
- Procure all equipment and components required for a commercial system
- Perform construction management and/or construction
- Lead commissioning, startup and optimization efforts

Representative projects

Rescued the utility from an 800MW de-rate of their coal-fired units through quick thinking and rapid response

In April of 2016, within weeks of the MATS compliance deadline, a utility resumed operation of its selected mercury control technology only to discover that at elevated unit loads mercury emissions were above the 1.2 lb/TBtu limit. If a solution could not be found, the utility faced de-rating over 800 MW of capacity to maintain compliance.

The client was able to operate its units across the load spectrum from the compliance date forward due to AECOM's quick analysis and response time. Within one week of being contacted by the utility, AECOM evaluated the most likely technology options to bring the unit into compliance and began a test program to validate the recommended technologies. The test showed that a minimal addition of halogen to the coal would allow the plant to operate at full load at mercury emission levels comfortably below the MATS limits.

Highlights

- **Successfully identified most likely technology to bring unit into MATS compliance**
- **Helped client avoid an 800MW unit de-rate**
- **Quickly mobilized and performed demonstration test within one week**

Reduced sorbent costs through multi-variable analysis of mercury emissions data

A large utility had selected a proprietary combined halogen addition and sorbent injection technology for MATS mercury control across their multi-unit, multi-station fleet. The ability of the technology to achieve MATS mercury compliance had been established at each station, but more work was needed to optimize rates for the two reagent types to minimize the cost of achieving MATS compliance. The units fired coal with high and variable mercury concentration.

AECOM significantly reduced the utility's operating costs for mercury control through a systematic analysis of the mercury control performance data. Unit-specific multi-variable mercury emissions modeling was used to develop algorithms to control reagent feed rate as fuel quality changes. Reagent usage was further reduced by minimizing mercury re-emissions through resolving wet FGD ORP measurement and control issues.

Highlights

- **Significantly reduced sorbent costs by developing control algorithms for sorbent addition**
- **Optimized mercury compliance for units firing coal with high and variable mercury concentration by using multi-variable data analysis**
- **Optimized FGD controls to minimize mercury re-emissions**

Designed holistic approach to MATS and ELG compliance while improving operational flexibility

AECOM identified and implemented a solution for a Midwestern power plant to meet a stringent sulfuric acid mist emission limit and achieve MATS and ELG compliance.

AECOM selected SBS Injection™ Technology to reduce SO_3 concentrations in the flue gas to <2 ppmd and to reduce mercury emissions from 2.5 to 1.0 lb/TBtu. Further reductions in mercury emissions to 0.3 lb/TBtu were achieved with installation of an HBS Injection™ system. SBS Injection has shown high levels of selenium capture (i.e., >85%), which supports future ELG compliance strategy.

Compared to competing SO_3 mitigating technologies such as dry sorbent injection (DSI) and wet electrostatic precipitator (WESP) technology, SBS Injection significantly reduces SO_3 levels in the flue gas, does not adversely impact particulate collection equipment, and saves a typical power plant up to $100M in capital investments and up to $10M in annual operation costs.

Highlights

- **Reduced plant operating costs by $10M per annum**
- **Supported ELG compliance by >85% reduction of selenium concentrations in the gas stream**
- **Achieved MATS compliance without ACI and halogen additives**

Preserved fuel flexibility for power plant

Faced with stricter regulations for control of mercury, HCl, and SO_2 from coal-fired flue gas, our client was unsure that the regulations could be met for their plant configuration and was contemplating a switch to natural gas. The client contacted AECOM because of our extensive experience designing and managing air pollution control test programs for coal-fired utilities.

The client maintained coal-firing on its units after AECOM demonstrated in a test program that modest capital equipment upgrades would achieve compliance with pending air emissions regulations. For the test program, AECOM designed and actively managed a dry alkaline sorbent injection and ACI test program. Several fuel options and sorbent combinations were evaluated, including milled and unmilled trona and several engineered hydrated lime products.

Highlights

- **Maintained fuel flexibility for the plant**
- **Performed economic assessment of fuel/compliance options**
- **Developed and managed complex test program**

Optimized existing SCR and FDD systems for low-cost mercury control

AECOM developed a fleet-wide strategy to achieve MATS-compliant mercury emissions at a fraction of the capital and O&M cost of sorbent injection on multiple units. The strategy included revision of the SCR catalyst management plan to incorporate mercury-oxidation-optimized catalyst, optimization of forced oxidation air controls to avoid high ORP excursion in the FGD systems (which can cause mercury re-emission), and the implementation of a mercury re-emission additive system at each plant to provide added protection that mercury re-emissions do not limit FGD mercury capture. As an added benefit, the optimized oxidation air controls lowered parasitic power usage under low-load and low-inlet SO_2 conditions.

Highlights

- **Optimized SCR for maximum mercury control benefit**
- **Optimized FGD operations for maximum mercury control benefit**
- **No ongoing expense for mercury sorbents**

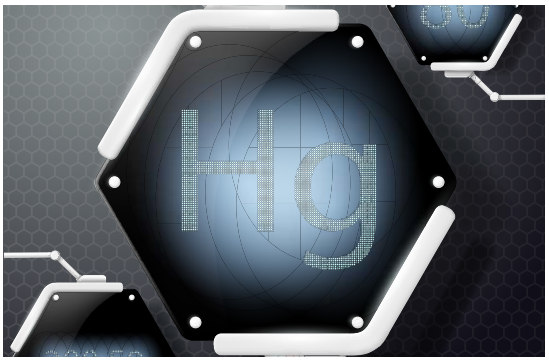
Met MATS mercury limits through better understanding of mercury measurement data

A coal-fired power plant was unable to achieve mercury emissions below the MATS limit of 1.2 lb/TBtu with halogen addition to the coal and FGD re-emissions additives. The utility believed that mercury re-emission was the limiting factor. The units at the plant had difficult configurations (low-Cl coal, hot-side ESP, FGD) for mercury control. The utility hired AECOM to evaluate its emissions data and assist in development of a mercury control strategy for the plant.

AECOM delivered a mercury control technology strategy that enabled the client to meet the MATS mercury emissions limit. The client had previously considered a high capital cost solution because halogen addition appeared insufficient. AECOM reviewed the utility's test data and determined that the mercury measurements were flawed. The speciated sorbent trap measurements over-predicted mercury oxidation at the FGD inlet. AECOM recommended higher halogen dosage rates to maximize oxidation, a re-emissions dosing strategy to maximize the effectiveness of the reagent, and operational changes to the FGD to further reduce re-emissions.

Highlights

- **Maximized FGD co-benefits**
- **Low capital cost solution**
- **Identified MATS compliance solution through troubleshooting flue gas mercury measurements**



Achieved MATS mercury compliance for a challenging plant configuration

A utility with coal-fired units that have a difficult emissions control configuration for mercury control (no SCR, hot-side ESP, wet FGD) had tested several proprietary mercury control technologies with no success. The utility came to AECOM to help devise a successful mercury control strategy. The plant would be shut down if cost-effective controls could not be identified.

AECOM integrated three different mercury control technologies (halide addition to the coal, ACI upstream of the wet scrubber, mercury re-emission additive) from three different vendors to produce a viable mercury control strategy at a cost which allowed the units to remain in operation. After selecting the technology approach, AECOM supported the utility with engineering, procurement support, and construction oversight for a low capital cost implementation of the technologies. The units completed testing to establish low mercury emitter status for the affected units.

Highlights

- **Innovative combination of technologies from three vendors**
- **Low capital cost implementation**
- **Successful operation to establish low mercury emitter status for the units treated**

Optimized mercury concentrations in FGD gypsum and wastewater

Most limestone forced oxidation FGD systems that capture mercury for MATS compliance must maximize transfer of scrubbed mercury to the absorber slurry solids to avoid re-emissions. These plants need a way to control the fate of mercury in the slurry solids. If the plant beneficially reuses the gypsum, the end user may enforce mercury concentration limits, which in turn limit how much mercury can leave with the gypsum. If the plant produces disposal gypsum, they may desire to produce higher mercury gypsum to lower the amount of solid-phase mercury going to wastewater treatment.

AECOM has developed procedures to characterize the mercury concentration of absorber slurry solids by particle size and to predict the minimum mercury concentration that could be achieved in the gypsum. This information is then used to support hydrocyclone tuning to optimize how the slurry solids separate between the underflow (product gypsum) and overflow (return to absorber and/or purge to dewatering).

Highlights

- **Minimized mercury in gypsum, or lower solid-phase mercury in FGD wastewater**
- **Hydrocyclone optimization services**
- **Developed innovative sampling and analytical procedures for mercury in gypsum**

About AECOM

AECOM is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A *Fortune 500* firm, AECOM had revenue of approximately $18 billion during fiscal year 2015. See how we deliver what others can only imagine at aecom.com and @AECOM.

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