LEHDER’s Capabilities for Assisting Natural Gas Fired Power Plants

**Introduction**

With the recent initiatives for cleaner sources of energy, a large number of Natural Gas Fired Power Plants have been constructed. LEHDER specializes in assisting these power plants with environmental services which include:

- Turbine Tuning
- Performance Tests
- Certification RATA
- Semi-annual and Annual RATA
- CEM QA/QC Audits
- Regulatory Reporting
- Environmental Compliance Approval

**Turbine Tuning**

Gas Turbine Tuning optimizes the performance of the gas turbine unit. Concentrations of O₂, CO and NOₓ are measured while the turbine owner fine tunes the operating parameters in order to optimize the turbine performance.

LEHDER provides real time instantaneous O₂, CO and NOₓ concentration data using calibrated analyzers in our mobile continuous emissions monitoring trailers. US EPA instrumental test methods are utilized to measure the gas concentrations.

**Performance Testing**

Performance guarantee tests are typically required to demonstrate contractual performance requirements are met between the equipment manufacturers and source owners of natural gas power plants. Compliance tests to meet the facility Environmental Compliance Approval requirements may also be required.

Typical test parameters include: Combustion Gases (O₂, CO₂, CO, NOₓ and SO₂), Total Hydrocarbons (THC), PM₁₀ Particulate, Ammonia Slip (if using ammonia injection) and Volumetric Flow Rate to determine pollutant emission rates.

LEHDER typically utilizes US EPA Methods to complete the performance guarantee tests. Test Protocols are submitted to the equipment manufacturers and source owners to ensure all testing is conducted using approved methodologies.
**Relative Accuracy Test Audit (RATA)**

A RATA is essentially a comparison of the facility Continuous Emission Monitoring (CEM) system data and LEHDER reference method data to ensure the facility CEM meets the applicable regulatory criteria. The criteria are listed in the facility Environmental Compliance Approval which typically refers to the Environment Canada EPS 1/PG/7 Protocol.

Typical RATA parameters are O₂, CO, NOₓ and flow. These are measured by LEHDER using approved US EPA Methodology. A minimum of nine tests (a maximum of twelve tests) are completed to evaluate the plant CEM system performance. LEHDER compares the data after each test to determine the status of the CEM system. Complete pass or fail data are provided to the facility at the end of the day.

**Certification RATA**

A Certification RATA is completed on a newly installed CEM system. The Certification RATA is completed to ensure the facility CEM system meet the Environment Canada EPS 1/PG/7 Protocol or facility Environmental Compliance Approval criteria.

Part of the Certification process also involves conducting a 7 Day Drift and Response Time test during the 168 hour Operational Test Period (OTP). During the OTP the CEMs must operate normally without any unscheduled maintenance. The Certification RATA is typically conducted after the OTP to ensure everything is operating properly.

**Semi-annual and Annual RATA**

The Semi-annual or Annual RATA is completed on a CEM system that has already been certified. The RATA is completed to ensure the facility CEM system still meets the Environment Canada EPS 1/PG/7 Protocol or facility Environmental Compliance Approval criteria.

In the first year of operation two RATA programs should be conducted. If the CEMs meet the EPS 1/PG/7 exemption criteria after the first year, only one RATA per year is required.

**CEM QA/QC Audits**

As per the EPS 1/PG/7 Protocol an annual independent inspection of the CEMs QA/QC Manual must be conducted. Part of the inspection also involves inspecting the actual CEM equipment in place. LEHDER has a broad understanding of CEM systems and the requirements to conduct the audit.

LEHDER recommends that some one other that the company performing the RATA perform the audit so that the findings are not biased.
Regulatory Reporting

Canadian Federal and Provincial laws dictate various emissions reporting requirements which impact power producers. In Ontario, these include:

- The National Pollutant Release Inventory (NPRI) which was created in 1992 to provide information on pollutants released to the environment and transferred for disposal. Reporting of NPRI is mandated under the Canadian Environmental Protection Act (CEPA) and is due by June 1 of the following year.

- The Federal Greenhouse Gas Regulation requires reporting of emissions for six greenhouse gases and related species for all facilities that meet or exceed a release threshold of 50 kilotonnes of carbon dioxide equivalent. If a facility meets or exceeds the reporting threshold, submissions must be made by June 1, 2010.

- Ontario promulgated a Greenhouse Gas Regulation (O. Reg. 452) in December 2009. The first reports will be due June 1, 2011 and will reflect the 2010 reporting year. Calculation methodologies are very prescriptive in this regulation so it is to the facility’s benefit to review their current federal reporting calculations and streamline them.

- Ontario Regulation 397 sets limits for airborne emissions of nitrogen oxides (NOx) and sulphur dioxide (SO₂) from Ontario’s larger electricity generators and defines the rules (the Code) for the creation and trading of the associated emissions reduction credits (ERCs) and allowances. Each capped emitter is required to monitor its actual emissions throughout the year and report annual and seasonal emissions amounts. By March 31, each facility must report their emissions and retire the appropriate volume of allowances to balance the emissions. Facilities must apply for emission allowances by June 1 each year. Allowances are distributed to each facility based on the estimated electricity production for the following year.

LEHDER works with our clients to provide a strategic approach to effectively complete all reporting requirements. We then complete a thorough review of data requirements and gaps, while compiling a multifaceted data management system specific to each facility. All reports outline the assumptions, calculation methodologies, conclusions and recommendations as required, and supporting documentation. LEHDER will also fully populate the data in the required online reporting web sites.
Environmental Compliance Approval (ECA)

In Ontario, most industrial facilities are required to have Environmental Compliance Approval granted by the Ontario Ministry of the Environment (MOE) in order to operate. If a business's activities impact the natural environment, that business needs an approval from the MOE to operate legally in Ontario.

Proactive facilities that invest in a compliance management plan will have greater success in maintaining compliance, which translates into savings of time and money.

The ECA with Limited Flexibility (ECA-LF) is now the preferred Approval of the Ontario Ministry of the Environment. This approach is expected to reduce the delays encountered currently in gaining approvals and to improve Industry focus on maintaining compliance with O.Reg. 419.

The benefit of an ECA-LF is that it allows companies the opportunity to make modifications to their facility without requiring an application for an amendment. An ECA-LF incorporates all air emission sources at a site, with several exceptions, into one ECA document.

LEHDER's approach to Environmental Compliance Approval applications includes:

- Reviewing all existing ECA's, documents, applications, and source inventory
- Development of a strategic approach for the application to ensure operational flexibility
- Updating of the source and emission inventory for current and proposed plans
- Assisting clients in navigating acoustical (noise) assessment requirements
- Preparation of the complete application including Emission Summary and Dispersion Modeling (ESDM) Report
- Liaison and negotiation with MOE review engineers

Questions

For further information on all of the services we provide please contact:

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About LEHDER

LEHDER Environmental Services is an environmental consulting company focused on providing Excellence in Industrial Air Quality Services. Formed in 1995, LEHDER is now one of the largest Air Quality Management companies in Canada.

All Air Quality aspects – source testing, emission inventories, air dispersion modeling, data interpretation and approval applications – are managed internally.

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