Trace Environmental Systems

Providers of Continuous Stack Monitoring Systems

www.traceenv.com

Trace Overview

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Trace Overview

Kevin Ramazan Ph.D.

VP Of FTIR Analyzer Operations

California Analytical

Trace Overview

- Provide Fully Compliant Stack Monitoring and Reporting Systems
  - CEM Systems (Hardware Based)
  - PEM Systems (Software Based)
- Started in 1995
- 20 Employees
- Installed at over 60 Ethanol Production Facilities
- Installed at over 55 Biomass Power Plants

Trace Overview Continued

- Serve industries such as Power Generation, Petroleum, Waste Incinerators, Chemical Production, Bio Fuels, Biomass Power and others
- Three Main Components of Trace Offering:
  - Complete, Turn-Key Stack Monitoring Systems
  - DAS Reporting Software
  - Ongoing support services (field and remote)

Typical System Make Up

Climate Controlled, Walk-in Shelters

Shelter

Climate Controlled Interior

Shelter

Accessible components for operators

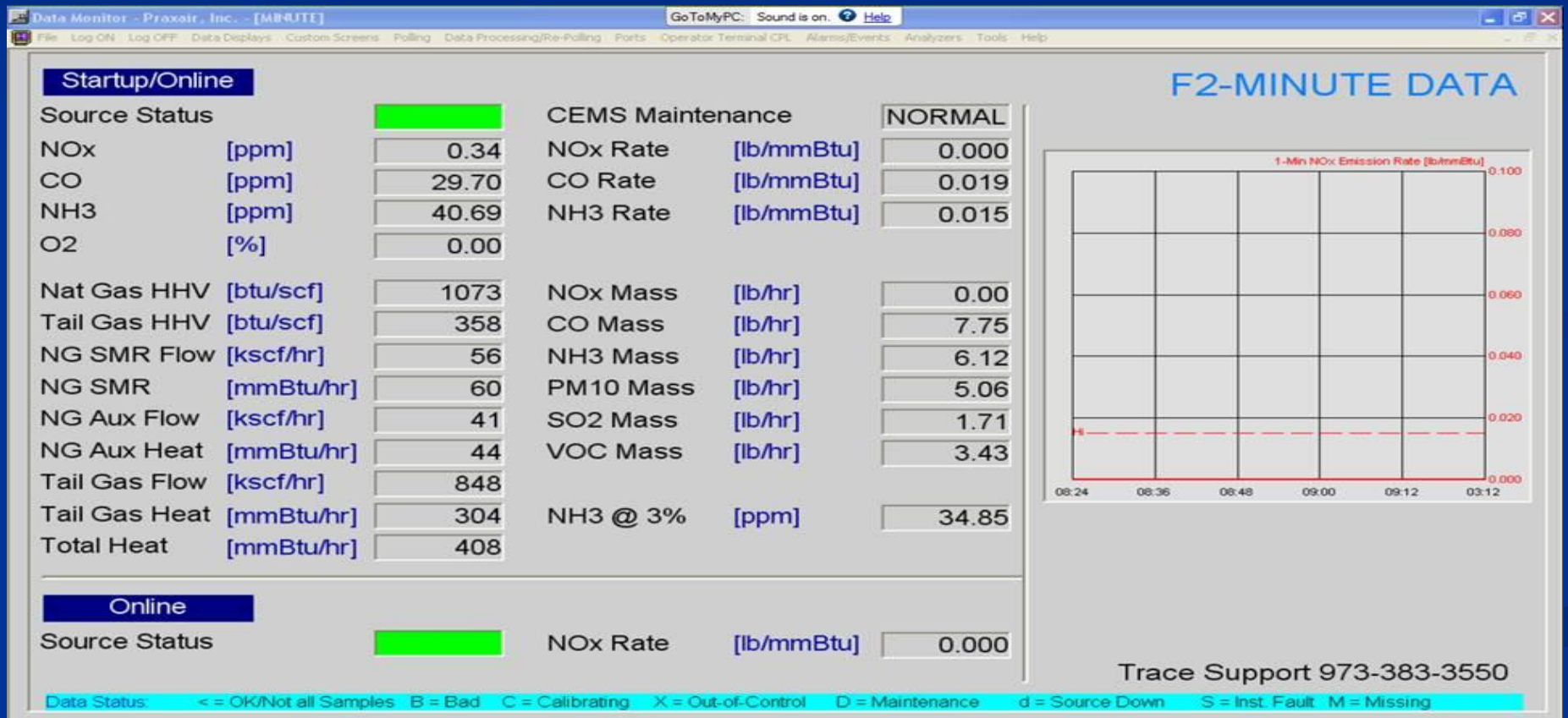
Typical System Make Up

Free Standing Cabinets

Calibration Gas Arrangement

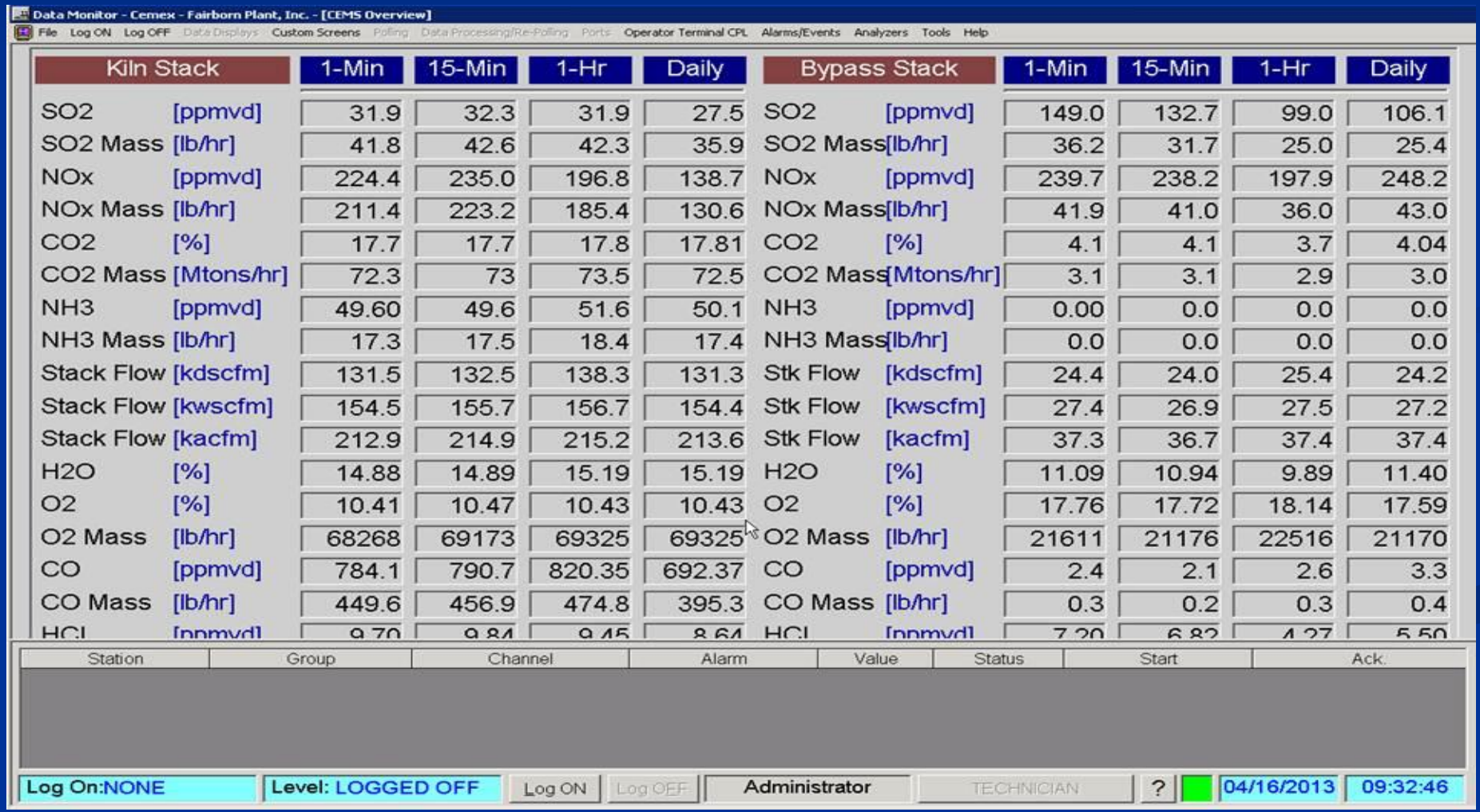
Calibration Gas Arrangement

DAS Reporting Software
Sample Operator Screen



Station	Group	Channel	Alarm	Value	Status	Start	Ack.
Single Station	1-Hr Startup/Online	SO2-m	Limit	1.71	Ack Active	03/25/2013 15:00:00	04/05/2013 08:50:53
Single Station	24-Hr Rolling (NH3)	NH3 @3%	Limit	34.85	Ack Active	03/25/2013 15:00:00	04/05/2013 08:50:54
Single Station	24-Hr Rolling (NH3)	NH3 @3%	Limit	34.85	Ack Active	03/25/2013 15:00:00	04/05/2013 08:50:55
Single Station	12-Month Rolling	NH3-m	Limit	141.56	Ack Active	01/01/2013 00:00:00	03/19/2013 12:48:02

DAS Reporting Software
Sample Operator Screen



Stack Monitoring at Biofuel Plants

- U.S. EPA ruled that the Thermal Oxidizers and HRSG's at ethanol production facilities are akin to a boiler and are thus categorized as a Steam Generating Unit

Stack Monitoring at Biofuel Plants

- Boilers and TO/HRSG units at or greater than 100 MMBtu/Hr. heat input capacity are subject to US EPA 40 CFR Part 60 Subpart Db….and thus must continuously monitor their stack emissions for NOx and O2.

Stack Monitoring at Biofuel Plants

- Traditional method of meeting the regulatory requirements:

CEMs

Continuous Emissions Monitoring

Stack Monitoring at Biofuel Plants

CEMs Made up of:

- Probe
- Heated Umbilical Line
- Cabinet or Shelter
- Analyzers, pumps, sample coolers, PLC, solenoids, rotameters, calibration gas bottles, regulators, wiring, plumbing, etc.

Stack Monitoring at Biofuel Plants

- Alternative Method of meeting regulatory requirements: US EPA Promulgated Performance Specification 16 (PS-16)

PEMs

Predictive Emissions Monitoring

Stack Monitoring at Biofuel Plants

- PEMs

Made up of:

PC and Software

Stack Monitoring at Biofuel Plants

- The ideal application for a PEMs is when it is replacing an existing CEMs.
- This large amount of historical emission data within the CEMs is used to develop a robust PEMs model.
- PEMs can run in parallel with the CEMs for any period of time

Stack Monitoring at Biofuel Plants

Operational Cost Savings Using PEMs

- No Daily Calibration Gas Bottles
- No Spare Parts
- No Component or Analyzer Failures
- No Technician Call-Out's

The cumulative year after year cost savings is significant

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

- Ethanol plants are required to perform regular stack emission testing for HAPs and VOC's from their CO2 Scrubber

- HAPs include: Acetaldehyde, Acrolein, Formaldehyde, Methanol and Ethanol

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

- Stack testing frequency varies depending upon expected annual emissions in tons. Testing can be required annually, twice per year, quarterly or more frequently

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

- CO2 scrubber emissions are controlled by use of water to control VOC's and chemical (Sodium Bisulfite) to control HAPs

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

- Water flow and chemical feed to the CO2 scrubber are set and fixed based upon stack test results
- This fixed control rate of max water and chemical usage could result in over use of both and wasted dollars for the biofuel plants

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

- NDEQ give the plants the choice to either perform stack testing or install a CEM on the CO2 scrubber stack.

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

Several Nebraska plants have already opted to install CEMs and no longer have to contract the periodic stack testing and do not have to maintain a fixed water and chemical feed rate….they can control emissions using only the correct amount of water and chemical needed…based upon real time CEMs readings

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

- The CO2 Scrubber CEM is just like a traditional CEM consisting of:
  - Stack probe and Stack Flowmeter
  - Heated Umbilical
  - Shelter or Free Standing cabinet with Analyzers and Plumbing
  - PC with DAS Reporting Software

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

- The HAPs are measured continuously using an FTIR Analyzer (Measures light absorption of gases)
- The VOC's are measured as Total Hydrocarbons using a THC Analyzer

Stack Monitoring at Biofuel Plants

CO2 Scrubber Stack Monitoring

- The FTIR/THC CEMs has performed reliably and well in this application and additional Nebraska plants have gone the route of CO2 Scrubber CEMs as a result of feedback from the use of CEMs in this application.

Thank You

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