

# Part 75 General Monitoring Requirements and Options

US EPA, Clean Air Markets Division (CAMD)

# Monitoring Deadlines for the CSAPR Rule



- Deadlines for Initial Certification for existing units:
  - Annual NO<sub>x</sub> Trading Program - January 1, 2012
  - Annual SO<sub>2</sub> Trading Programs— January 1, 2012
  - Ozone Season NO<sub>x</sub> Trading Program – May 1, 2012

# Monitoring Regulations



- 40 CFR Part 72.2
  - Basic Definitions referred to throughout Part 75
- 40 CFR Part 75 - Continuous Emissions Monitoring
  - General Monitoring Provisions
  - Operation and Maintenance Requirements
  - Missing Data Substitution Procedures
  - Record Keeping and Reporting Requirements

# Monitoring Regulations



- 40 CFR Part 75 – Key Appendices
  - Appendix A----Specifications and Test Procedures
  - Appendix B----CEMS Quality Assurance and Quality Control Procedures
  - Appendix D----"Excepted" SO<sub>2</sub> and Heat Input Monitoring Methods for Oil and Gas-Fired Units
  - Appendix E----"Excepted" NO<sub>x</sub> Monitoring Method for Oil and Gas-Fired Peaking Units
  - Appendix F----Equations, F-factors

# CSAPR Monitoring Requirements



- SO<sub>2</sub> Mass Emissions (lb/hr)---Annual SO<sub>2</sub> Program, only
- NO<sub>x</sub> Mass Emissions (lb/hr) – Subpart H (§§75.70-75.75)
- Heat Input (mmBtu/hr)

# Reporting Requirements - Subpart H NOx Monitoring



- Annual Reporting
  - Submit quarterly Electronic Data Reports via ECMPS
  - Only the NOx mass data from the Ozone Season is used for emissions trading in the CSAPR ozone season trading program
  - Follow standard Part 75 QA/QC timelines and data validation procedures
  - A must for Acid Rain units
  - May be required by the State rule (check with state)
  
- Ozone Season-Only Reporting----allowed only in FL,OK,AR,LA, and MS
  - Only submit 2nd and 3rd quarterly electronic reports
  - Follow special QA/QC timelines and data validation procedures described in §75.74(c)
  - This option is a choice not a requirement
  - You don't get "grace periods" for QA tests and other flexibilities available to annual reporters

# Monitoring Options for Determining NO<sub>x</sub> Mass Emissions



- Under the CSAPR rule, you may determine NO<sub>x</sub> mass emissions either by measuring:
  - NO<sub>x</sub> Concentration (ppm) & Stack Flow Rate (scfh)---this is a CEMS methodology; or
  - NO<sub>x</sub> Emission Rate (lb/mmBtu) & Heat Input Rate (mmBtu/hr)

# NO<sub>x</sub> Emission Rate Monitoring Methodologies



- There are three NO<sub>x</sub> Emission Rate Monitoring methodologies in Part 75:
  - NO<sub>x</sub>-diluent CEMS, or
  - Appendix E (gas or oil fired peaking units, only)
  - LME Default NO<sub>x</sub> Emission Rate (gas or oil fired units, only)

# NO<sub>x</sub>-Diluent CEMS



- The NO<sub>x</sub>-diluent system consists of two components:
  - NO<sub>x</sub> Concentration Monitor
  - CO<sub>2</sub> or O<sub>2</sub> Concentration Monitor
- Section 3 in Appendix F of Part 75 provides the equations that are used to compute NO<sub>x</sub> emission rate (lb/mmBtu) from the CEMS data

# Appendix E



- Applicable only to Gas and Oil-Fired “Peaking Units” (as defined in 40 CFR 72.2)
- May be used in lieu of a NO<sub>x</sub>-diluent CEMS for determining hourly NO<sub>x</sub> emission rate (lb/mmBtu)

# Appendix E (cont'd)



- Peaking unit (§ 72.2 - Definitions)
  - An average capacity factor of no more than 10.0% during the previous three calendar years and
  - A capacity factor of no more than 20.0% in each of those three calendar years
  - Ozone season only reporters can qualify on an ozone season only basis (see §75.74(c)(11))
- Initial qualification for peaking status by
  - Three years (or ozone season) of historical capacity factor data, or
  - For new units, projected capacity factor information
  - For units with some (but < 3 years) of historical capacity factor data available, a combination of historical and projected capacity factor information

# Appendix E (cont'd)



- Units that have a change in their annual capacity factor percentage may qualify as peaking units by:
  - Collecting three calendar years of data following the change to meet the historical capacity factor data requirement; or
  - Collecting one calendar year of data following the change showing a capacity factor of less than 10.0% and providing a statement that the change is considered permanent

## Appendix E (cont'd)



- Units that hold peaking status must continue to meet both the 10% three year and 20% single year (or ozone season) criteria on a “rolling” 3-year basis, to retain peaking status
- If a unit fails to meet the peaking unit criteria for a given calendar year, the owner/operator must install & certify a NO<sub>x</sub> emission rate CEMS by December 31 of the year immediately following the year in which peaking unit status was lost
- A unit that has lost peaking unit status may re-qualify only by providing three new years (or ozone seasons) of qualifying capacity factor data

# Appendix E (cont'd)



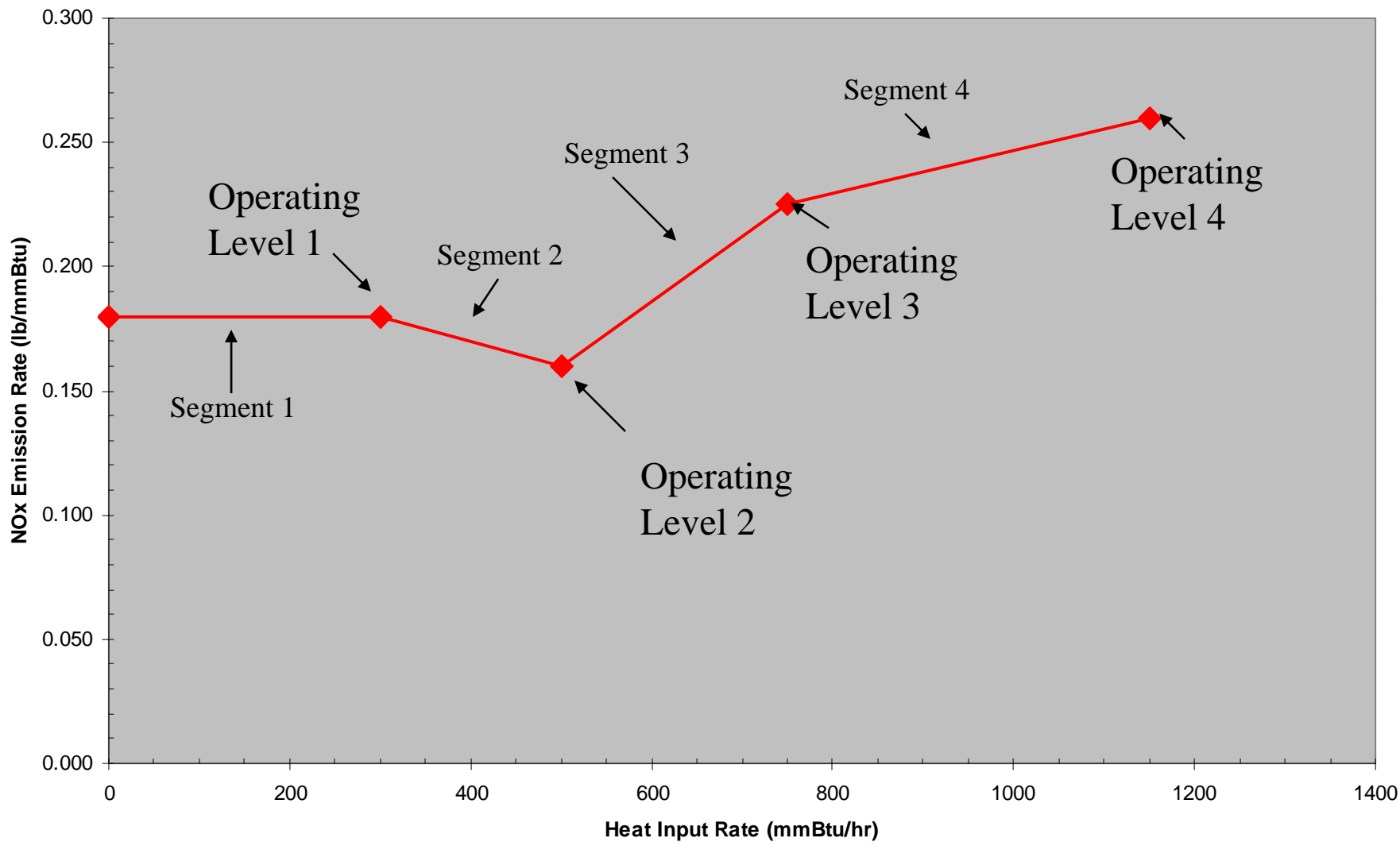
- For boilers or stationary gas turbines,  $\text{NO}_x$  emission rates (lb/mmBtu) are determined at four equally spaced load levels by conducting fuel-specific  $\text{NO}_x$  emission rate testing:
  - Use EPA Method 7E for the  $\text{NO}_x$  testing
  - Use Method 3A for the diluent gas testing
  - Measure fuel flow rates during the testing, using a certified Appendix D fuel flow meter
  - Use measured fuel flow rate together with fuel GCV to determine the heat input rate at each load level (mmBtu/hr)

## Appendix E (cont'd)



- Prepare a correlation curve of NO<sub>x</sub> emission rate vs heat input rate----program it into your DAHS
- Use the correlation curve to determine the NO<sub>x</sub> emission rate corresponding to the heat input rate for each hour

# NO<sub>x</sub> Correlation Curve Segments



# LME (§75.19)



- The LME methodology will be addressed in a separate presentation

# SO<sub>2</sub> Monitoring Methodologies



- There are three basic SO<sub>2</sub> mass emissions monitoring methodologies in Part 75:
  - CEMS
  - Appendix D (oil and gas-fired units, only)
  - LME (oil and gas-fired units, only)



- SO<sub>2</sub> mass emission rates (lb/hr) are determined from:
  - Measured SO<sub>2</sub> concentrations, using a certified SO<sub>2</sub> CEMS; and
  - Measured stack gas flow rates, using a certified flow monitor; and
  - If necessary, measured stack gas moisture content (or a fuel-specific default moisture value)
- This methodology is required for coal-fired units and optional for oil and gas-fired units

# Appendix D



- **Applicability**
  - Gas and Oil fired units only
  - May be used in lieu of CEMS to monitor SO<sub>2</sub> mass emissions and heat input
- Hourly SO<sub>2</sub> mass emission rates are determined from:
  - Measured fuel flow rates (using a certified fuel flowmeter); and
  - Measured sulfur content of the fuel

# Appendix D (cont'd)



- Fuel Flow Meter Certification and QA
  - Each fuel flow meter must meet an accuracy specification of 2% for initial certification
  - For on-going QA, an additional accuracy test must be passed at least once every four “fuel flow meter QA operating quarters”
  - A visual inspection of orifice, nozzle, and venturi flow meters is required every 3 years

# Part 75, Appendix D



- Three types of fuel flow meters can be certified by design, if they conform to American gas Association Report No.3:
  - Orifice
  - Nozzle
  - Venturi
- All other fuel flow meter must be certified by measuring a flowing fluid, either in a lab or on-site. Some typical flow meters that require this type of testing:
  - Coriolis meters
  - Annubars
  - Vortex meters
  - Turbine meters
  - Ultrasonic meters

# Heat Input Rate Monitoring



- There are three Heat Input (HI) Rate monitoring methodologies in Part 75:
  - Stack Flow Monitor & \*Diluent (CO<sub>2</sub> or O<sub>2</sub>) Monitor
  - Fuel flow monitoring plus measured GCV (Appendix D)
  - LME----Max Rated HI for all hours or Long term fuel flow

\*Note: If the diluent is measured on a dry basis you must correct for moisture

# Certification Process Overview (excluding LME)



- Submit an initial monitoring plan and notification of initial certification testing 45 days prior to starting certification testing (§75.61 & §75.62)
- Conduct all required testing for the system(s) to be certified, e.g.:
  - 7-day Calibration Error Test
  - Cycle Time Test
  - Linearity Check
  - RATA & Bias Test
  - Appendix E stack test
  - Fuel Flow Meter Test
  - DAHS Verification

# Certification Process Overview (cont'd)



- Upon successful completion of all certification tests, the system(s) are provisionally certified
- The completed certification application is submitted within 45 days after completing all initial certification tests
- Permitting Authority has 120 days after receipt of a complete certification application to review the application and approve or disapprove certification