# Fine PM Test Method

Measurement Technology Workshop

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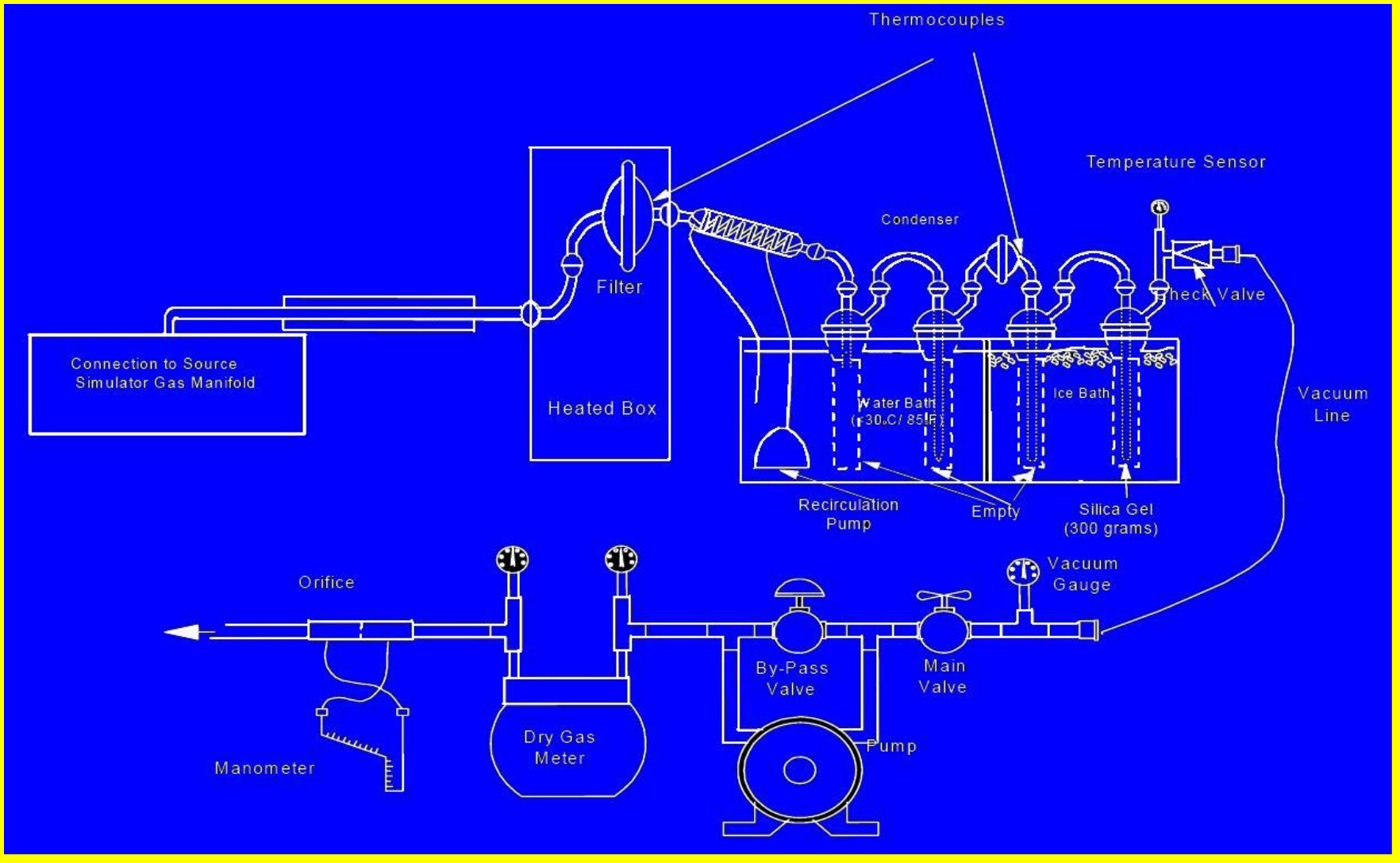
# Presentation Topics

- Condensable PM test method
- Particle sizing test method
- Implications of new test methods
- Test method changes from proposal

# Dry Impinger Train Layout



# Dry Impinger Method Performance

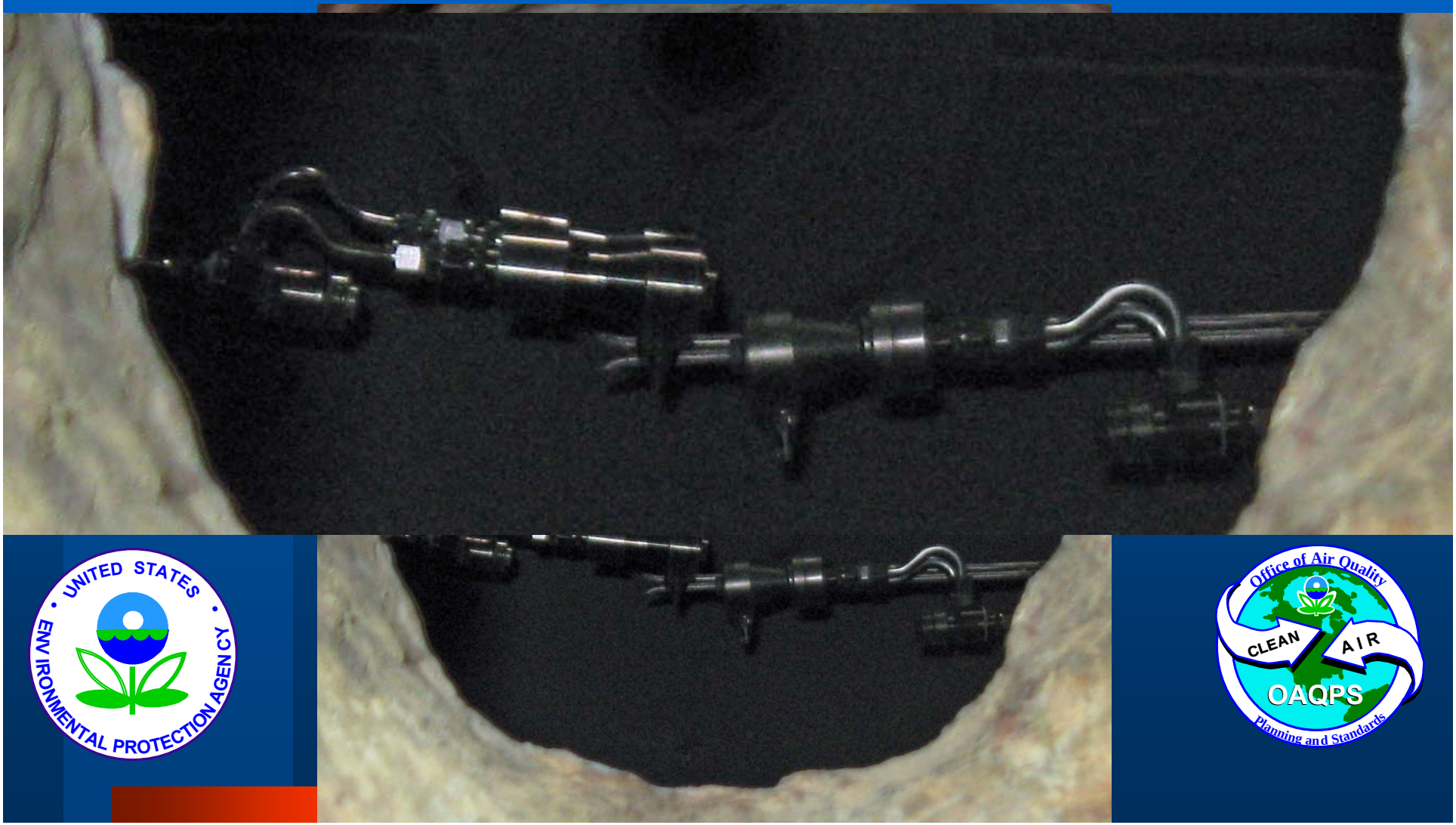
| Run | Organic (mg) | Inorganic (mg) | Filter (mg) | Total |
|---|---|---|---|---|
| 1 | 0.11 | 2.23 | -0.34 | 2.34 |
| 2 | 0.15 | 2.88 | -0.06 | 3.03 |
| 3 | 0.09 | 1.37 | 0.00 | 1.46 |
| 4 | 0.30 | 1.91 | 0.00 | 2.22 |
| 5 | 0.16 | 1.54 | 0.07 | 1.77 |
| 6 | 0.33 | 2.19 | -0.17 | 2.52 |
| 7 | 0.08 | 1.18 | 0.30 | 1.56 |
| 8 | 0.02 | 1.87 | 0.17 | 2.06 |
| Blank | -0.02 | 0.21 | 0.00 | 0.68 |
| Average | 0.16 | 1.90 | 0.00 | 2.12 |
| Std Dev | 0.1 | 0.51 | 0.17 | 0.45 |
| MDL | 0.31 | 1.54 | 0.49 | 1.36 |

# Filterable PM Sizing

- **Method 201A (1990)**

- **Method 201A**
  (2010)

# $PM_{10}$ & $PM_{2.5}$ Precision Testing



# CPM Precision

# Field Sampling Precision

# Precision Testing Results

- Filterable $PM_{2.5}$ precision ≈ 1 mg
- Total CPM precision ≈ 4 mg
  - Organic CPM precision ≈ 0.5 mg
  - Inorganic CPM precision ≈ 3.5 mg
- $H_2SO_4$ collection decreases with decreasing concentration
  - Once collected $H_2SO_4$ is retained
  - $H_2SO_4$ is good audit material

# $PM_{2.5}$ Regulatory Requirements

- **Clean Air Fine Particle Implementation Rule**
  - **Promulgated April 25, 2007**
  - **January 1, 2011 is critical date for $PM_{2.5}$**
  - **New or revised SIP rules must consider $PM_{2.5}$ in setting limits**
  - **NSR/PSD permits must also consider $PM_{2.5}$ in limits**
  - **Transition period was for development of improved knowledge using improved test method**

# Existing use of CPM Methods

- **Most States do not address CPM**
- **Some States address CPM**
  - **States test methods for CPM are inconsistent**
- **Only rules that are new or revised need consider CPM**
- **States do not have to use EPA's test method for acceptance of SIP or NSR/PSD rules**

# Implications of considering $PM_{2.5}$

- **States w/o CPM testing now**
  - **$PM_{2.5}$ will need to be addressed in new or revised emissions limits**
  - **Will likely adopt new test methods**
    - **Higher numerical limits do not mean higher emissions**
    - **State will need good information to know where they are and what revised limits will achieve**

# Implications of considering $PM_{2.5}$

- **States w/ CPM testing now**
  - **May convince EPA that their rules comply with intent of implementation rule**
  - **May wish to adopt new test method**
    - **Numerical limits will require adjustment**
    - **Adjustment requires careful consideration**
    - **Risk of errors may be greater than for States that are just now adopting CPM testing**

# Schedule for PM Test Methods

- **Signed by the Administrator**
  - **Effective date is January 1, 2011**
  - **Nucor Steel asked for extension**
- **Extensive Response to Comments**
  - **Response to major issues in preamble**
  - **Responses to other issues in RTC document**
- **Several minor changes from proposal**

# Changes from proposal (M201A)

- **Added definitions**
  - **Primary PM, $PM_{10}$, $PM_{2.5}$**
  - **Filterable PM**
  - **Condensable PM**
- **Revised/clarified method applicability**
  - **Small diameter stacks (blockage)**
  - **Wet stacks (water droplets)**
  - **Temperature limitations**
  - **Port size requirements**
  - **Particle sizing ($PM_{10}$ vs $PM_{2.5}$ vs both)**

# Changes from proposal (M202)

- **Definitions of Primary PM, $PM_{10}$, $PM_{2.5}$**
- **Replaced MeCl with hexane**
- **Modified filter media specifications**
- **Added optional glassware preparation**
  - **User determined – requires proof blank**
  - **Bake at 350ºC – no proof blank**
- **Clarified text in several areas**
  - **Terminology (field blanks, proof blank)**
  - **Applicability for wet stacks**
  - **Use of pH indicators**
  - **Requirement to use cleaned glassware**
  - **Nitrogen purge specifications**

# Comments or Questions