REINHOLD ENVIRONMENTAL Ltd.

2011 APC Round Table
& Expo Presentation

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ESP/FF Design Considerations for EGU MACT Compliance

2011 Reinhold APC Round Table

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Agenda

- Regulatory Requirements
- Overall Plant System Design
- Existing PM Collection System Design
- Up-Grading Existing PM Collection System
- Add a New PM Collection System
- Add a New DFGD System
- Conclusions

Regulatory Requirements

- Compliance with the new MACT Requirements
  - Meet the new Total PM Emissions Requirements
    - Filterable particulate matter
    - Plus condensed matter including SO_3
  - Meet the new Hg Emissions Requirements
  - Meet the NO_X & SO_2 Requirements

Overall Plant System Design

- Type & age of boiler
- Variations in coals fired
- Boiler design versus operating capacity
- System equipment arrangement (i.e. Boiler, economizer, SCR, APH, ESP, ID Fan, etc.)
- Flue gas temperature, pressure & composition
- Gas path flow distribution arrangement
- Performance of the existing system

Existing PM Collection System

- ESP size & arrangement
  - Hot side
  - Cold side
- ESP design & capacity
  - Age & condition
  - SCA of ESP & type of AVC system
  - Up-grade possibilities?
- Fabric Filter size & arrangement
  - Reverse gas; A/C ratio
  - High ratio; A/C ratio
- FF design & capacity
  - Age & condition
  - Cleaning system design & performance
  - Media selection

Up-Grade of Existing PM Collection System

- Can the up-graded equipment meet the new requirements?
- Is there space available for the changes required?
- What is the required cost & time for the conversion?
- Is sufficient power and fan capacity available?
- What is the OPEX for the new system?
- Any impacts on existing plant operations (i.e loss of sale of ash)?

Add a New PM Collection System

- Selection of the system design to be added must consider the new regulations
- Is there space available for the new system design?
- How & when can the system be tied into plant operations?
- Increased power & system pressure drop must be addressed
- Ash handling system modifications will be necessary
- What is the OPEX for the new system?
- Be careful with the carbon/ash ratio to avoid problems

Add a New DFGD System

- Considering the issues on the previous slide, adding a DFGD system may be a good choice
- The system can reduce PM, SO_2, SO_3, HCL and HF emissions
- With the addition of KNX and or PAC, Hg emissions requirements can be met
- Some of the risks regarding system operation are eliminated with DFGD systems

Conclusions

- It is important to understand what all of the required emissions from the plant must be before deciding what to do to address PM emissions
- Evaluation of the total plant system regarding size, arrangement and performance will impact the approach to meeting MACT requirements
- Fuel variations, flue gas composition and flow distribution will impact the system design
- Space availability, outage time, tie-in to plant operations could impact the approach to meet the regulations
- Modifications to existing systems versus addition of new equipment must be based on overall systems evaluations
- Adding a DFGD system with means to reduce Hg emissions may be the best choice

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