

REINHOLD ENVIRONMENTAL Ltd.



**2013 NO_x-Combustion Round Table
& Expo Presentations**

February 18 & 19, 2013, in Salt Lake City, UT / Hosted by PacifiCorp

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NO_x Control Project and Construction

Chris Wedig

Terry Gray

Panel 1 – NO_x in Context: What Works, and What are the Consequences?
Reinhold - 2013 NO_x-Combustion Round Table
February 18, 2013
Salt Lake City, Utah





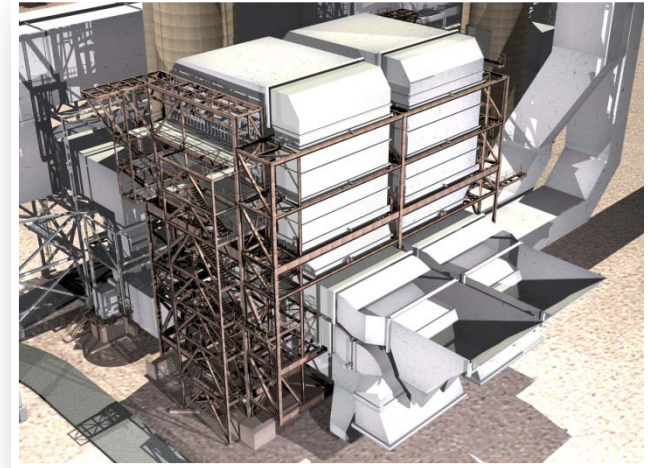
- Introductions
- Coal Fired NO_x Reduction Project Technology Options
- SCR Project Scope
- SCR Construction Safety and Activities
- Summary

Coal Fired NO_x Reduction Project Technology Options

- Fuel Type
- Low NO_x Burners
- Over-fired Air Systems
- Selective Non-catalytic Reduction (SNCR)
- **Selective Catalytic Reduction (SCR)**
- Other methods to control NO_x



- Safety
- Scoping, Planning and Scheduling
- Cost Controls
- Conceptual Studies
- Permitting
- Engineering & Design
- Procurement
- Fabrication
- Equipment Shipment and Delivery
- **Construction**
- Commissioning
- Start-up
- Testing
- Operation & Maintenance



- Ammonia (or urea) System
- Ammonia Injection Grid (AIG)
- Static Mixer
- LPA Screens (if required)
- SCR Reactor (with internals)
- SCR Catalyst
- SCR Catalyst Cleaning (sonic horns)
- Ductwork and Expansion Joints
- Air Heater Upgrades (if required)
- ID Fan Modifications (if required)
- Structural Steel
- Civil Works and Foundations
- Structural (steel, enclosures, stairs, etc.)
- Electrical (transformers, cable, PDC, etc.)
- Controls & Instruments
- DCS
- Balance of Plant (BOP)

- Piles
- Foundations
- Support Steel and Access
- SCR Boxes
- Catalyst
- Hoists
- Sonic Horns
- Insulation & Lagging SCR Box
- Ammonia (or Urea)
- Transformers (if required)
- PDC
- VFDs (if required)
- DCS
- Piping
- Electrical
- Lighting
- I & C
- Balance of Plant (BOP)







- Demolition duct from the economizer to air heater
- Demo existing fan and foundation (if required)
- Stiffen existing air heater (if required)
- Build new fan foundation (if required)
- Install new fans (and access platforms)
- Install SCR inlet duct
- Install SCR outlet duct
- Insulation and lagging
- Finish Piping Systems
- Finish Electrical
- Finish I&C
- Commissioning

Outage Duration

SCR Project Outage

Man hours

Crew Size @ Peak

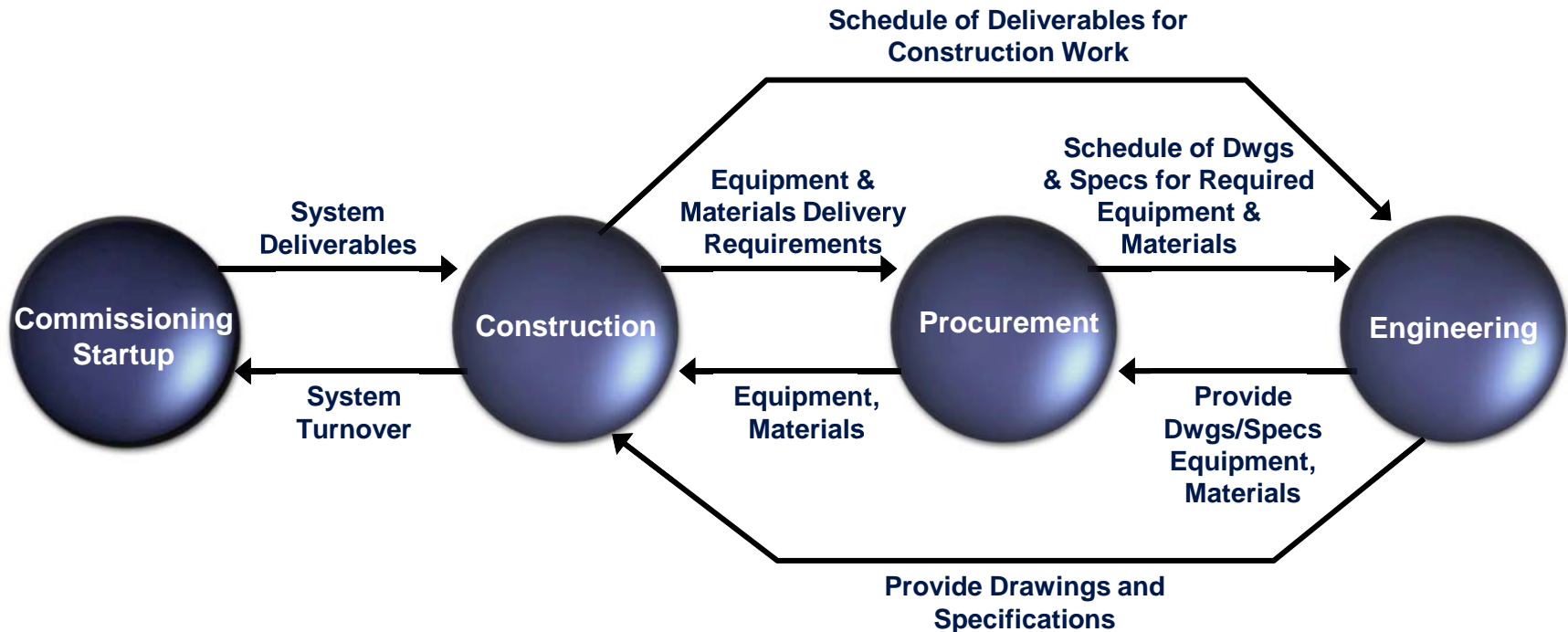
Craft Work – examples

- Boiler Makers
- Iron Workers
 - Electrical
- Insulating/Carpenters/Scaffolding
 - Pipe Fitting
 - Other

- System turnover packages
- Each system reviewed with Client and punch list developed
- Final punch list
- Turnover books reviewed with Client and given to customer at final completion



- Commissioning Manager
- Electrical and Mechanical Commissioning Leads
- Craft Support - as needed
- OEM Commissioning Manager
- Major Equipment Supplier Representatives



- Various technologies are available for NO_x control at coal-fired power plants.
- SCR retrofit is a large-scale project with numerous activities.
- Proper Safe Construction, commissioning, and start-up of an SCR system is key to a successful project.

