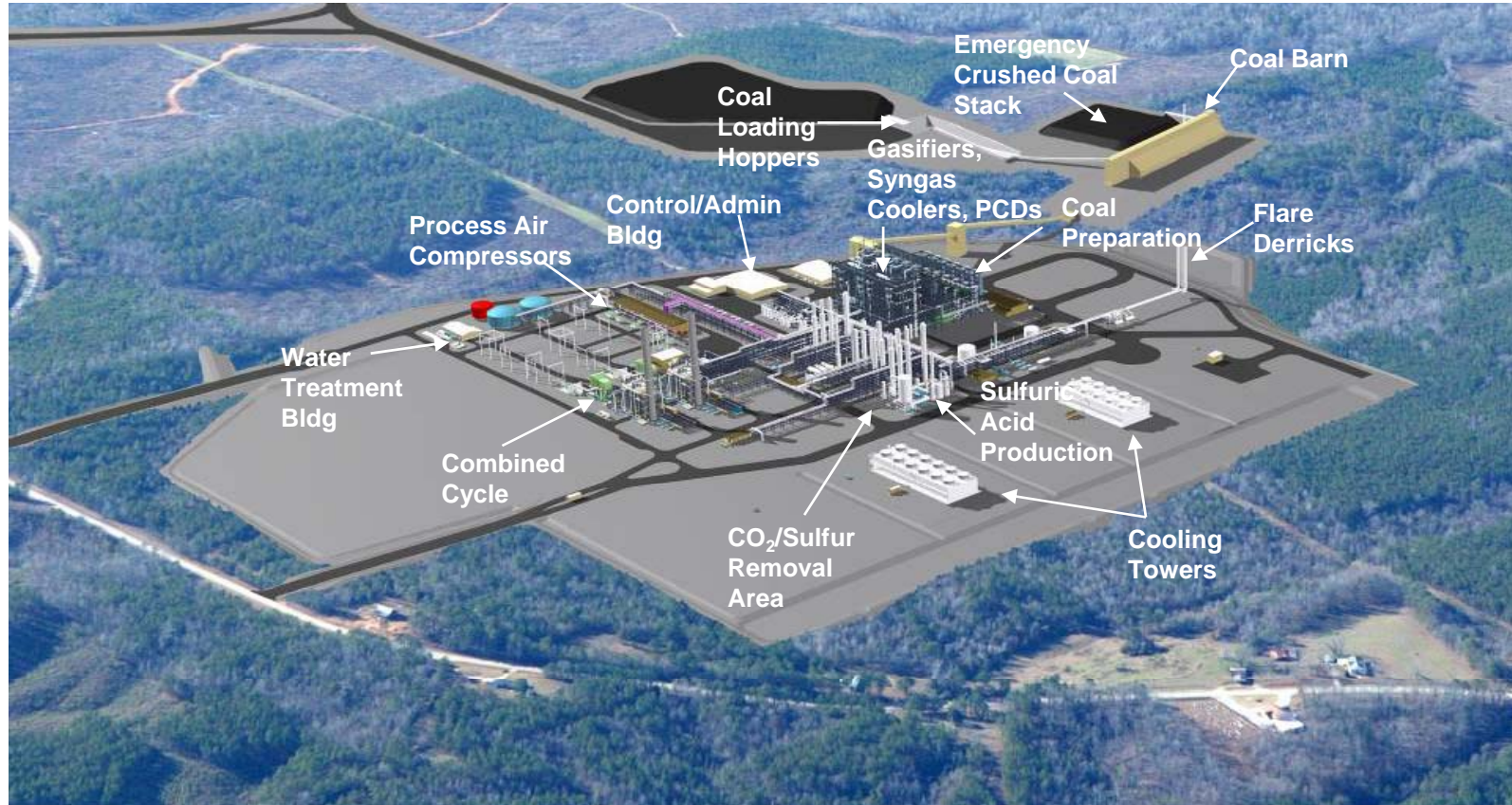


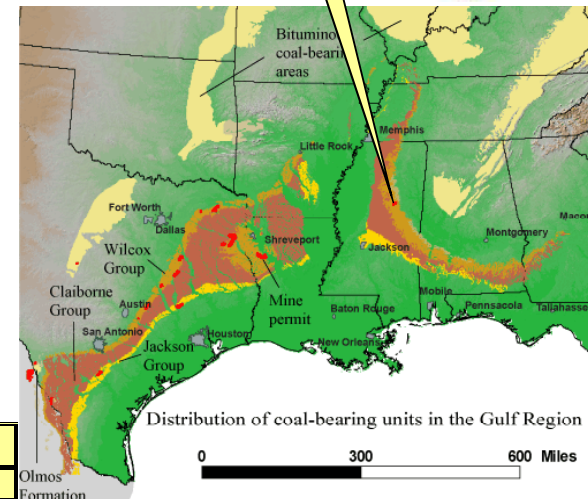
Overview of the Kemper County IGCC Project Using Transport Integrated Gasification (TRIG™)



2010 Gasification Technology Conference
Washington, D. C. - November 1, 2010

Kemper County IGCC Project Overview

- 2x1 Integrated Gasification Combined Cycle (IGCC)
 - 2 Transport Integrated Gasifiers (TRIG™)
 - 2 Siemens SGT6 - 5000F CTs
 - 1 Toshiba Steam Turbine (Tandem Compound Double Flow)
 - 582 MW peak and 524 MW on syngas
 - Heat Rate 11,708 Btu/kWh (29.5% HHV Efficiency w/ CO₂ control and 40+% moisture coal)
 - Selexol for H₂S and CO₂ removal
 - 65+% CO₂ capture (~800 lb/mWh emission rate)
 - Mine Mouth Lignite
- Owner & Operator: Mississippi Power
- Over \$2 billion capital investment
- Commercial Operating Date: May 2014
- Use treated effluent from Meridian as makeup water
- By-Products (TPY)
 - ~3,000,000 - Carbon dioxide used for EOR
 - ~135,000 - Sulfuric acid
 - ~20,000 - Ammonia

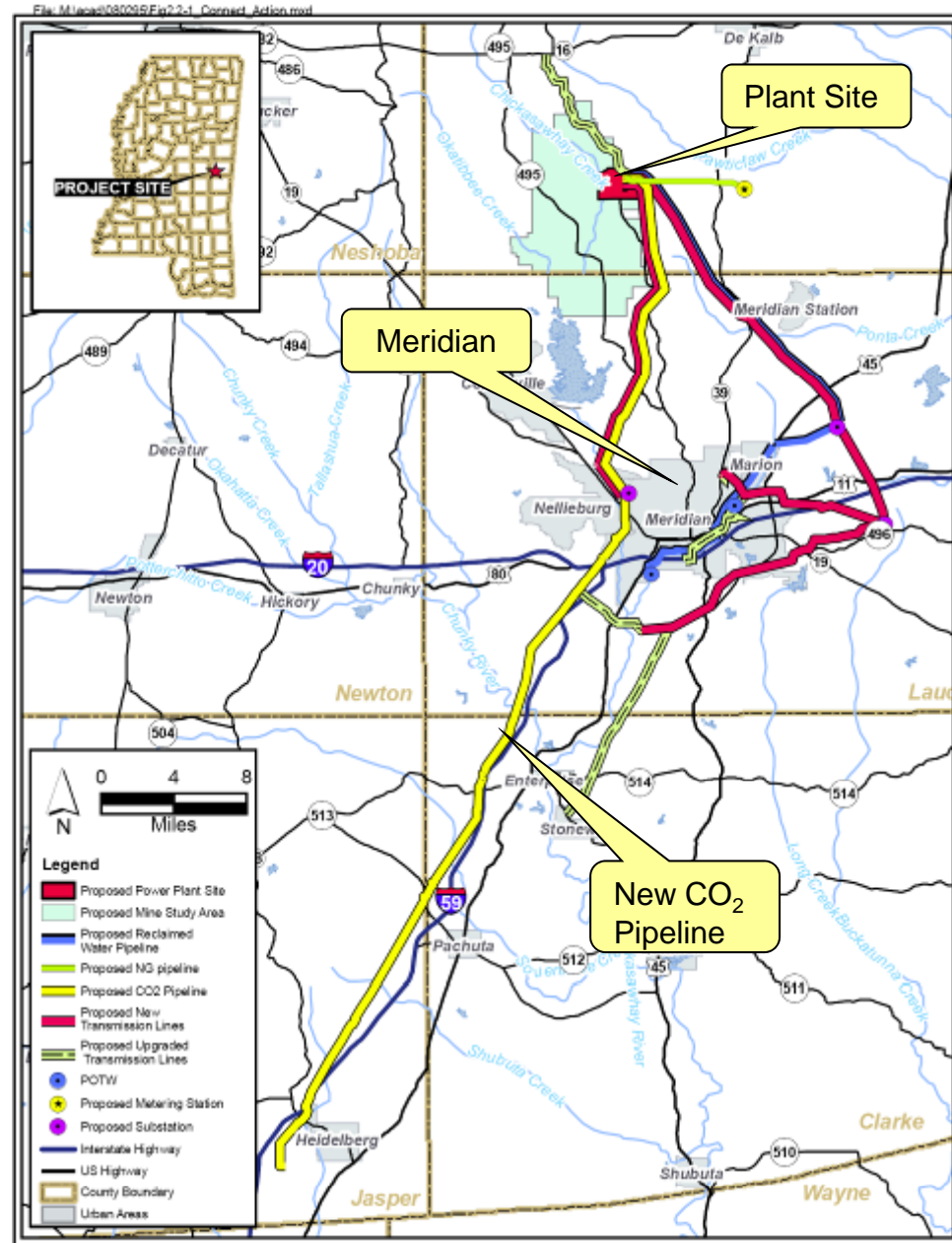


Kemper Lignite Composition				
		Average	Min	Max
Heat Content	btu/lb	5,290	4,765	5,870
Moisture	%	45.5	42	50
Ash	%	12.0	8.6	17
Sulfur	%	1.0	0.35	1.7



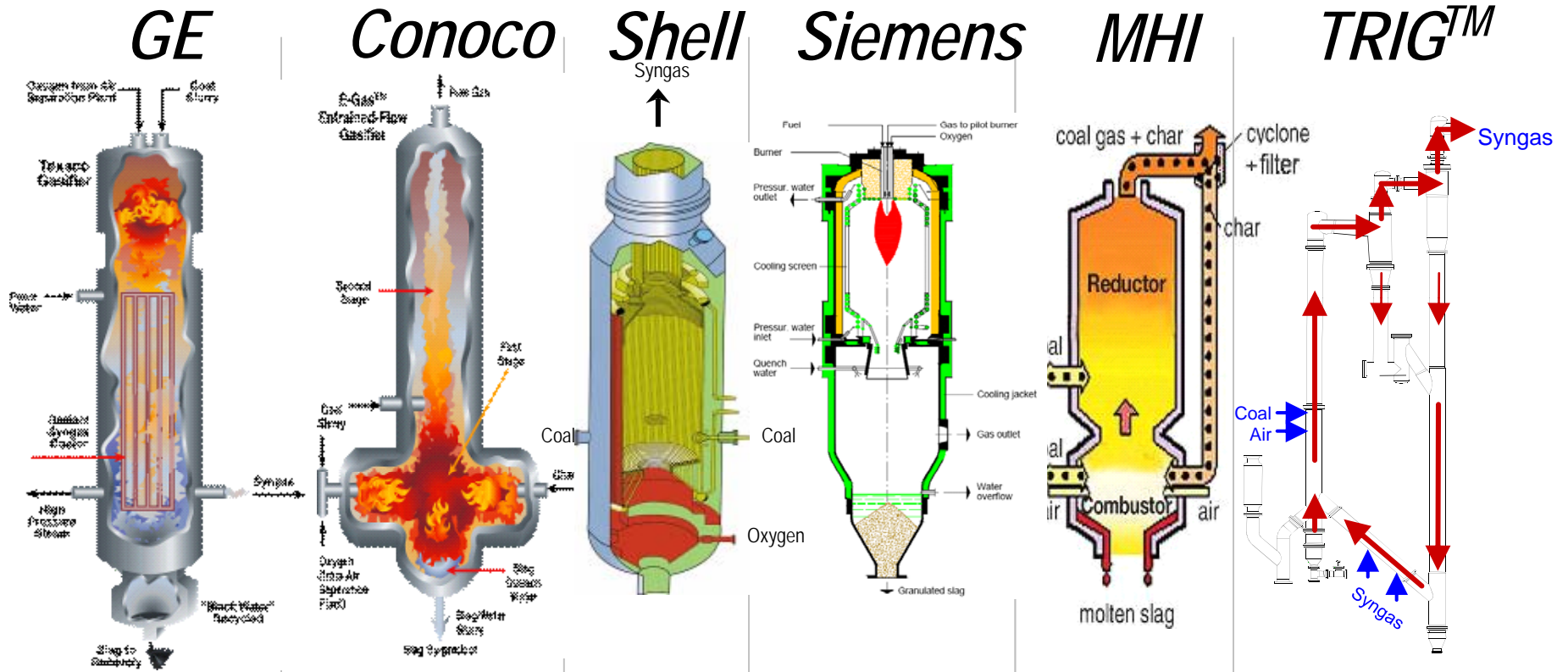
Kemper County IGCC Project Map

- ~ 70 miles transmission
- ~ 60 miles CO₂ pipeline (for EOR)
- ~5 miles natural gas pipeline
- ~31,000 acre mine site
- ~2,900 acres plant site
- ~ 30 miles treated effluent line



Visual Comparison of Main Gasifier Types

(Not to Scale)



Oxygen-blown

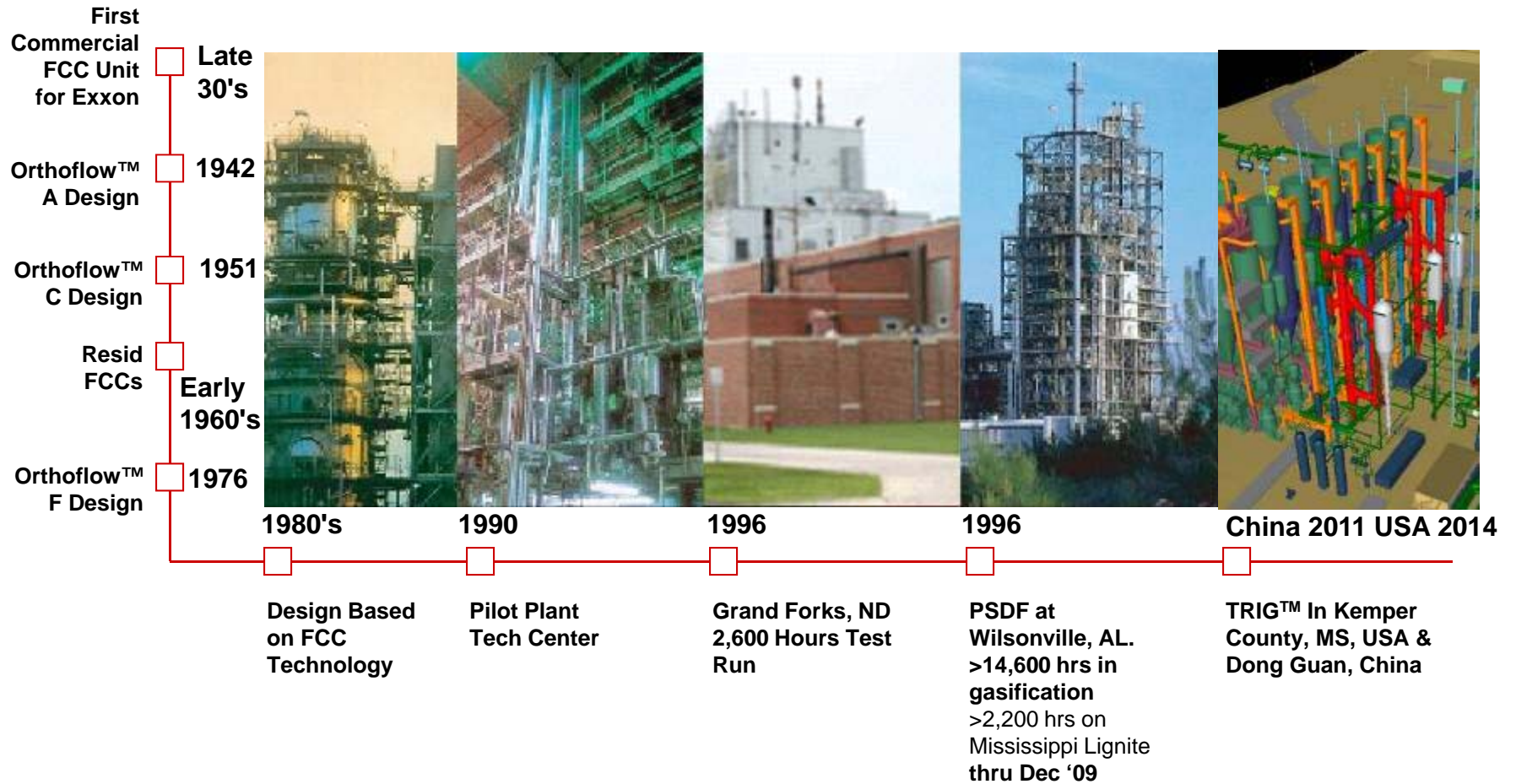
Air- or O₂-blown

Burner-type, slagging

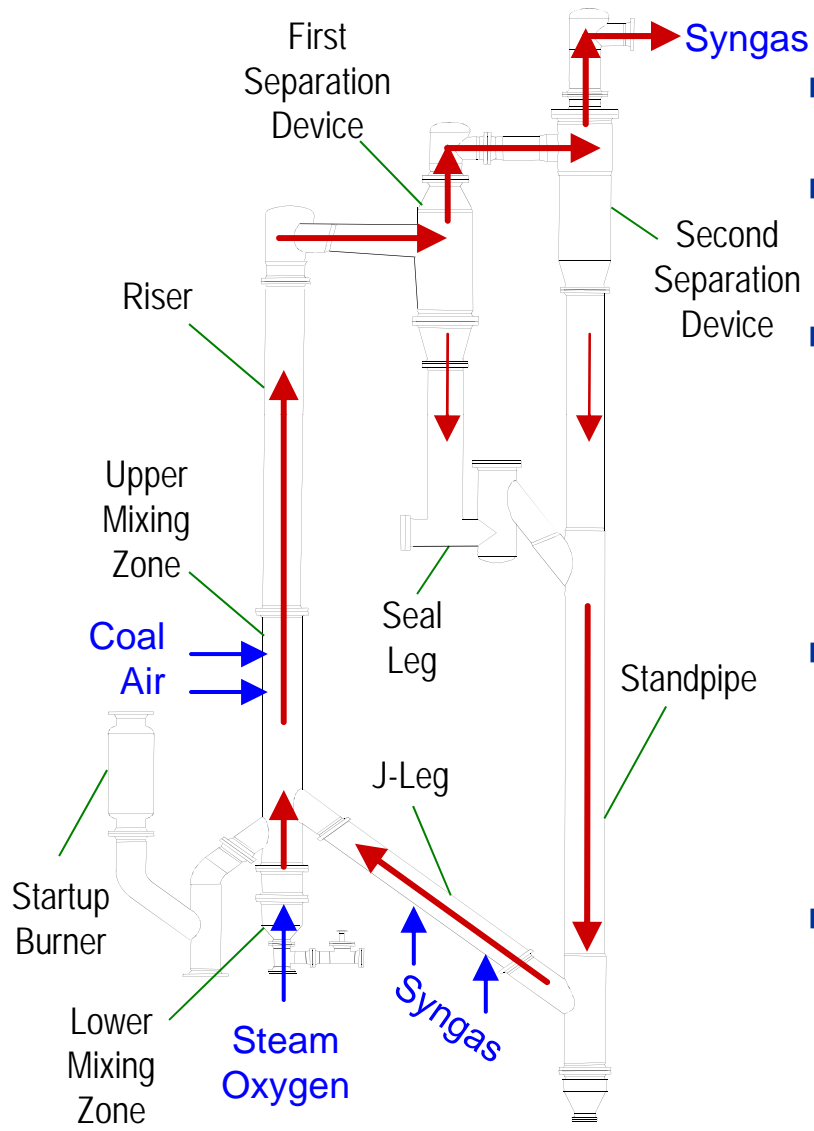
No-burner
Non-slagging

Development of the TRIG™ for Power and Chemical Production

TRIG™ Leverages Long History of KBR Fluid Catalytic Cracking (FCC) Expertise



TRIG™ IGCC Attributes / Advantages



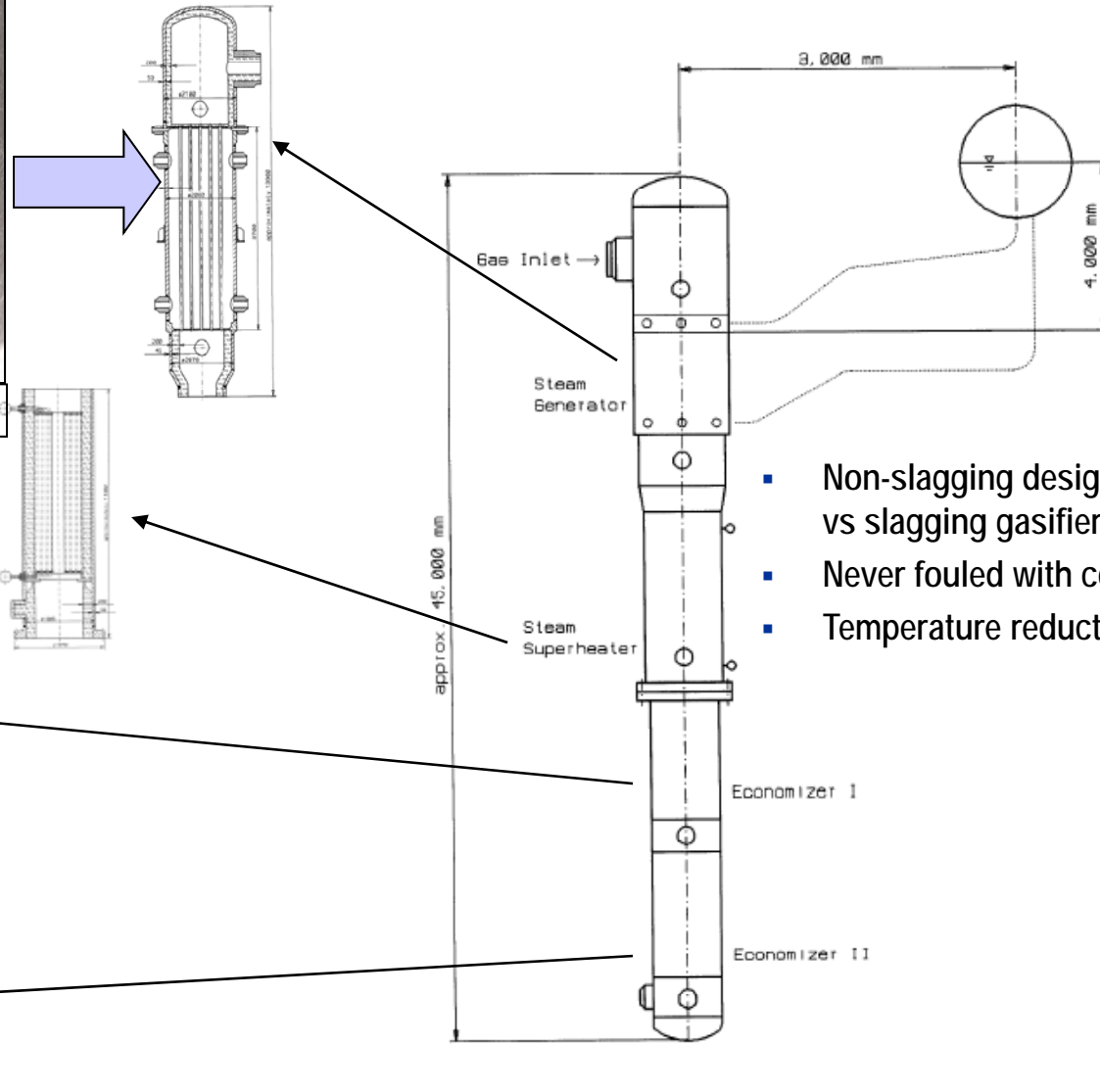
- **Simple, Well Established Design**
 - Based on technology in use for 70 years
- **Either Air- or Oxygen-Blown**
 - Air for power
 - Oxygen for liquid fuels and chemicals
- **High Reliability Design**
 - Non-slugging design:
 - Provides 10-20 year refractory life
 - Eliminates black water system
 - Provides non-fouling syngas cooler operation
 - No burners to fail and be replaced
 - Dry dust removal eliminates gray water system
- **Lower Fuel Costs**
 - Coarse, dry coal feed allows:
 - Fewer, lower power pulverizers
 - Less drying than other dry-feed gasifiers
 - Cost-effective using high moisture, high-ash, low rank coals (PRB and lignite)
- **Excellent Environmental Performance**
 - Lower water use compared to pulverized coal (PC)
 - Excellent emissions performance
 - Lower cost carbon capture compared to PC

Kemper Primary Syngas Cooler

(Commercial Design by Borsig)



PDSF cooler Inlet after 1300 hrs operation



- Non-slugging design leads to no fouling vs slugging gasifier designs
- Never fouled with coal ash
- Temperature reduction ~800 to 1000 °F

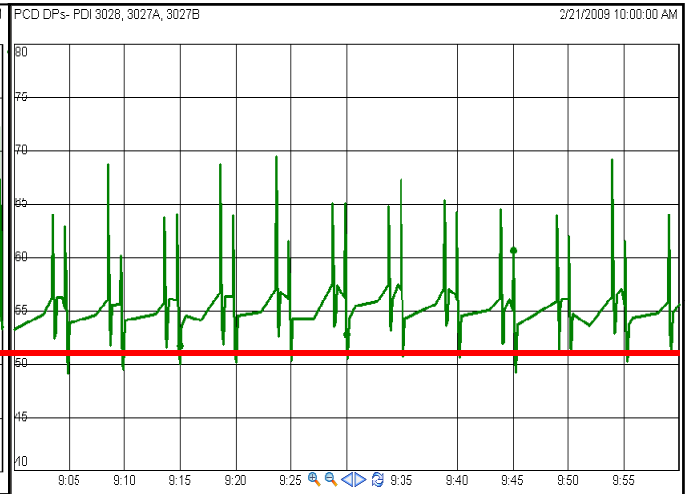
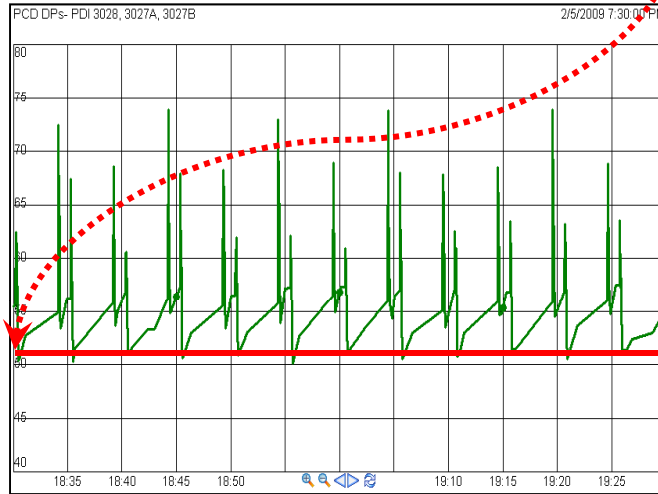
Dry Particulate Filtration – Proven Operation

Pressure Drop – Note Return to Baseline after each Pulse

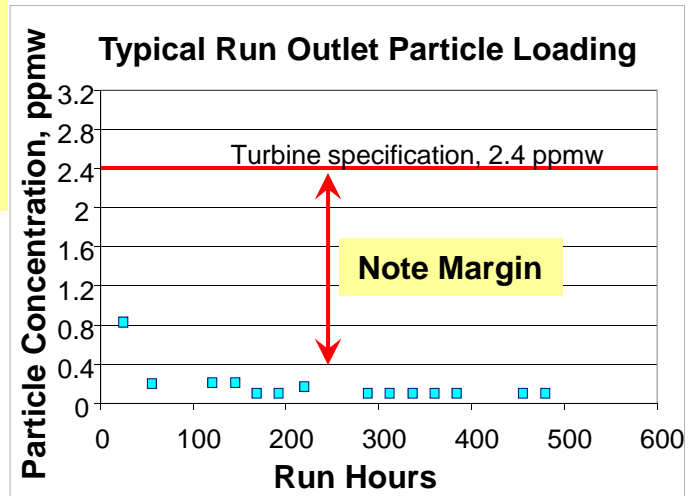
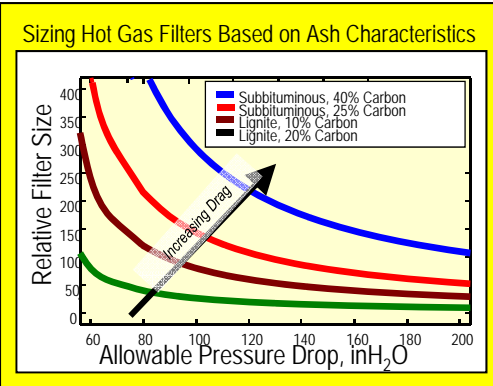


Beginning of run

End of run

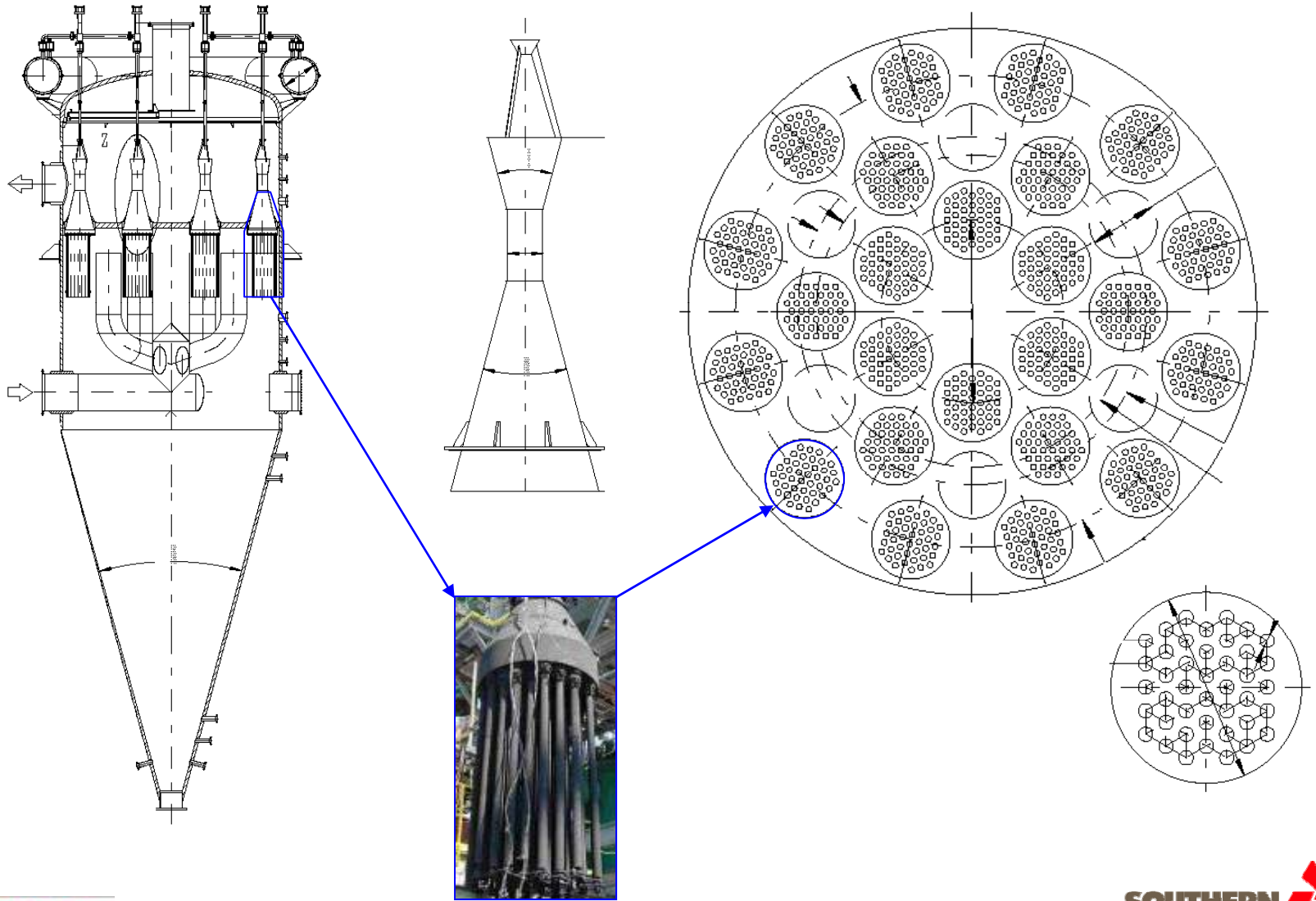


- Stable baseline pressure drop
- Excellent filtration performance >99.9999%
- Highly reliable failsafe system

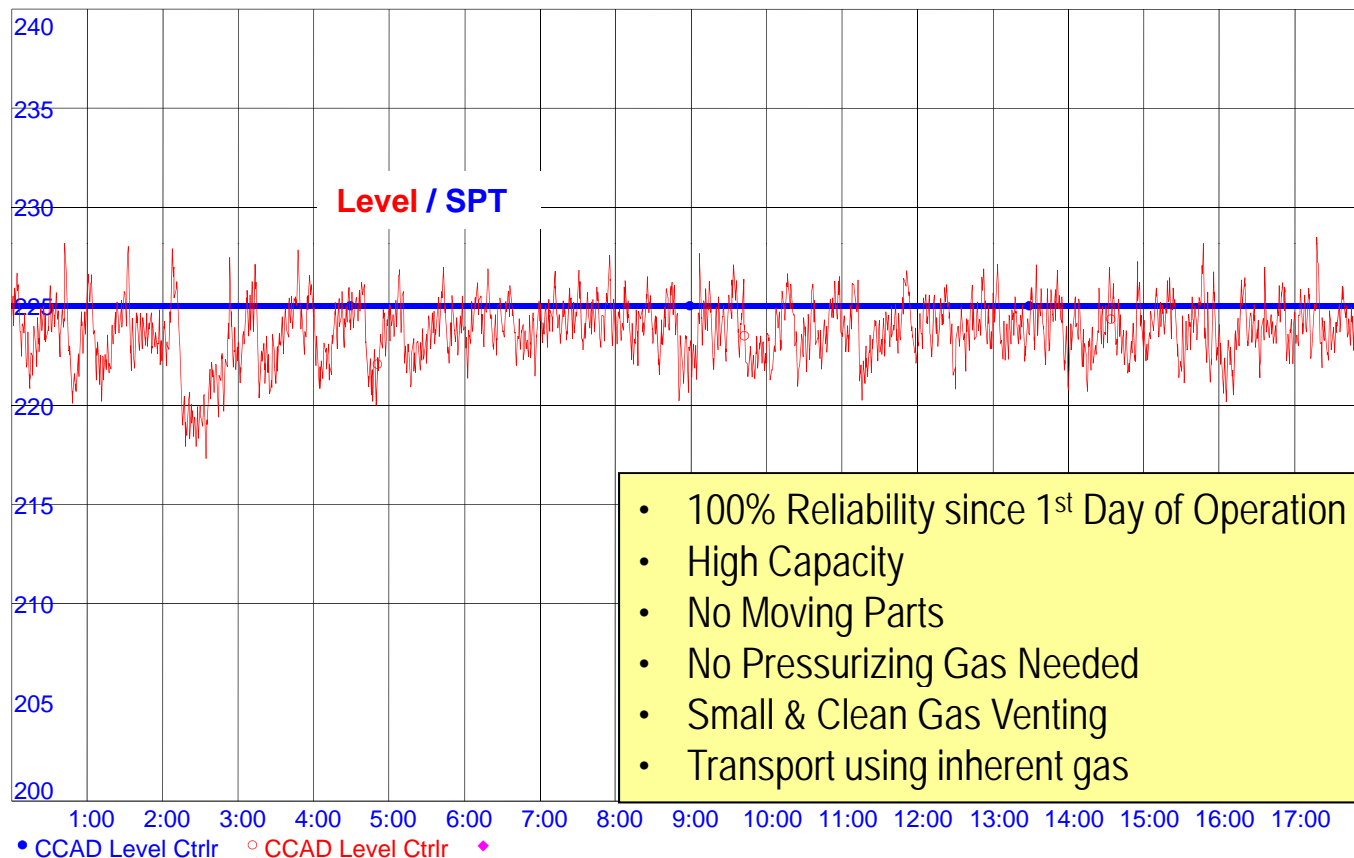


Kemper Dry Ash Filter

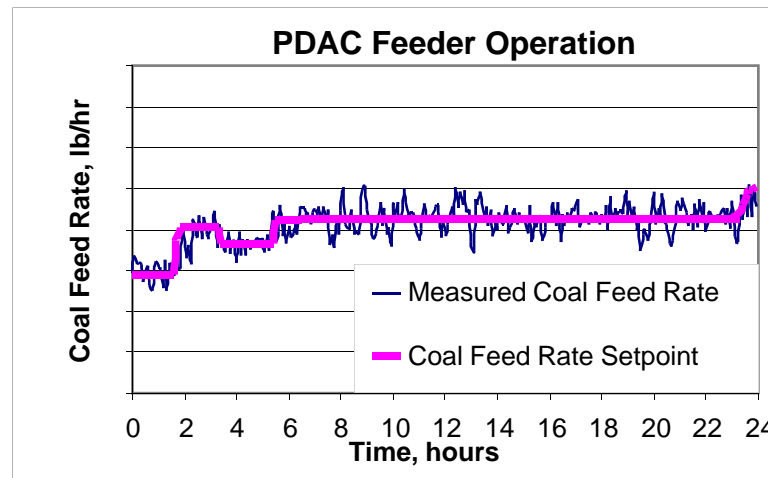
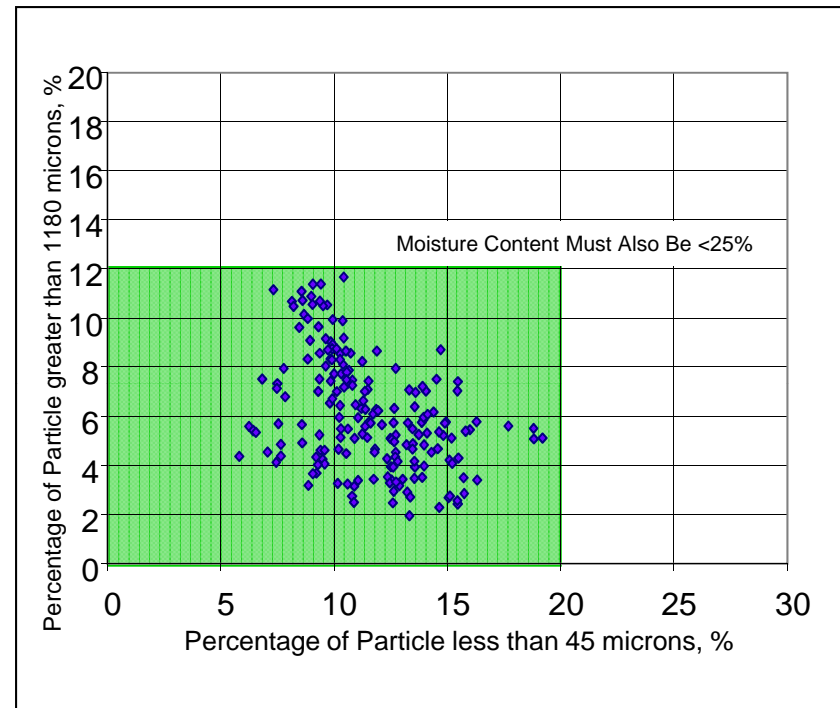
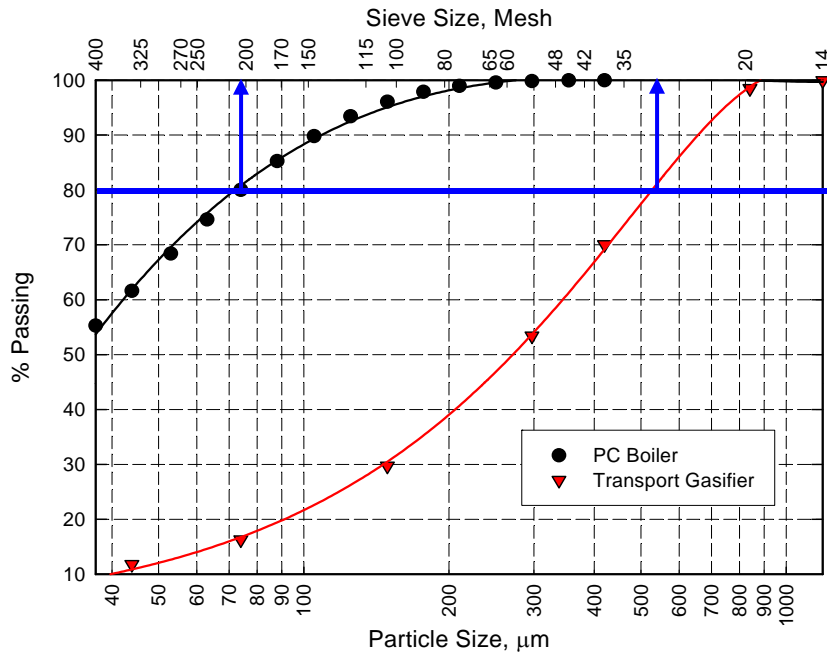
(Commercial Design By Pall)



Continuous Coarse Ash Depressurization (Gasifier Level Control Performance)



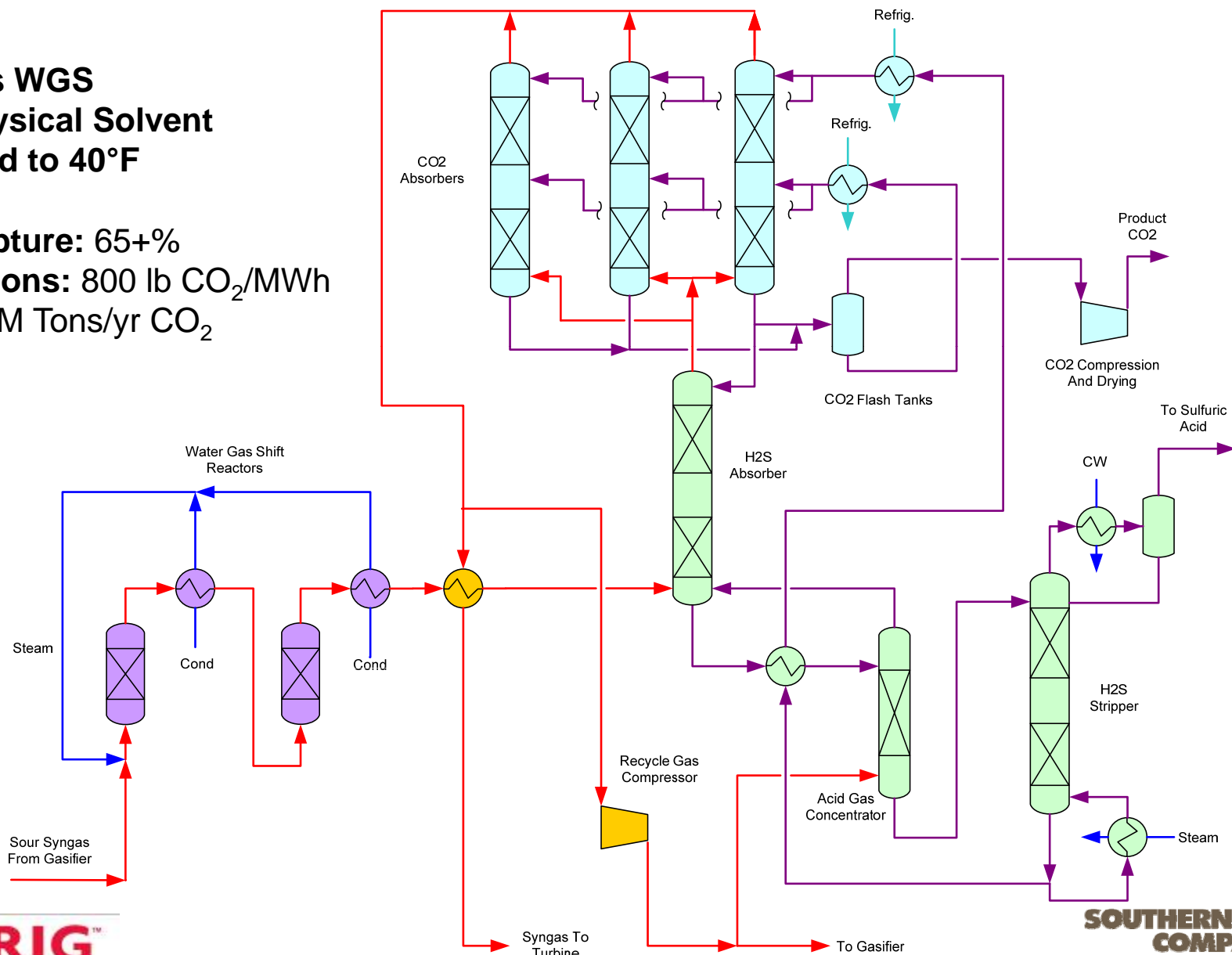
Typical Coal Feed Particle Size Transport Gasifier vs Pulverized Coal



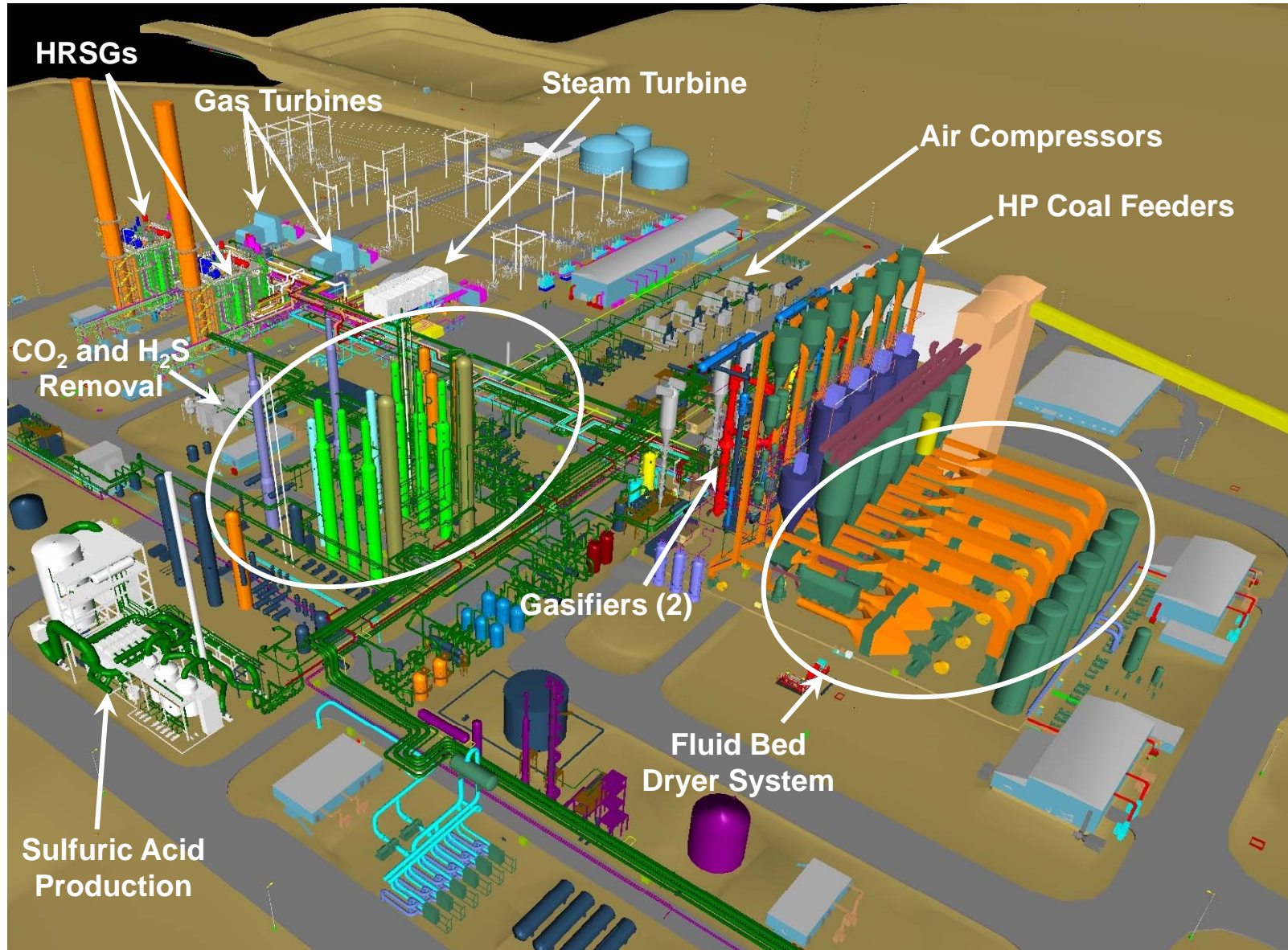
Kemper CO₂ Capture Scheme

Two Stages WGS
Selexol Physical Solvent
Refrigerated to 40°F

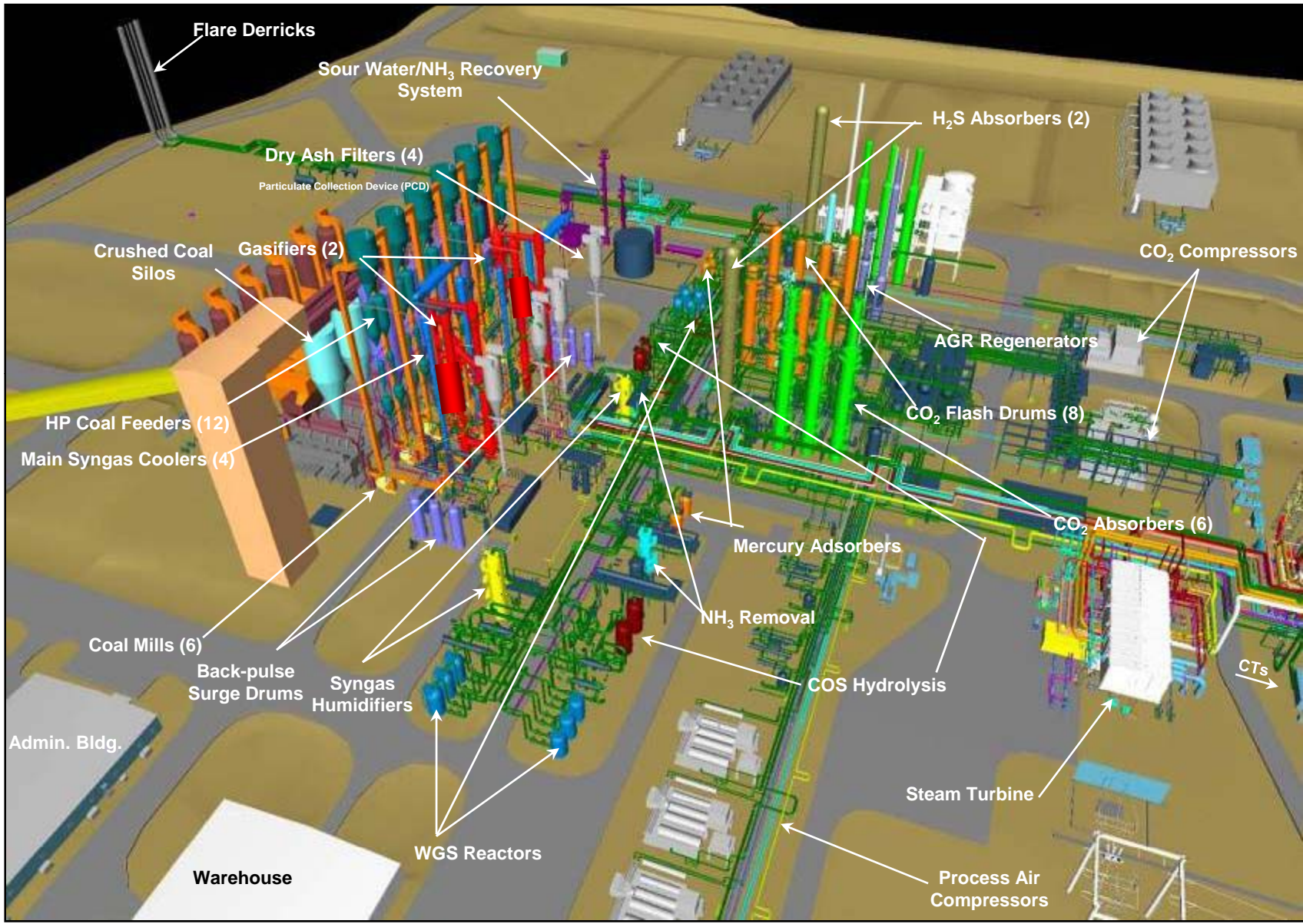
Carbon Capture: 65+%
CO₂ Emissions: 800 lb CO₂/MWh
Yield: >3 MM Tons/yr CO₂



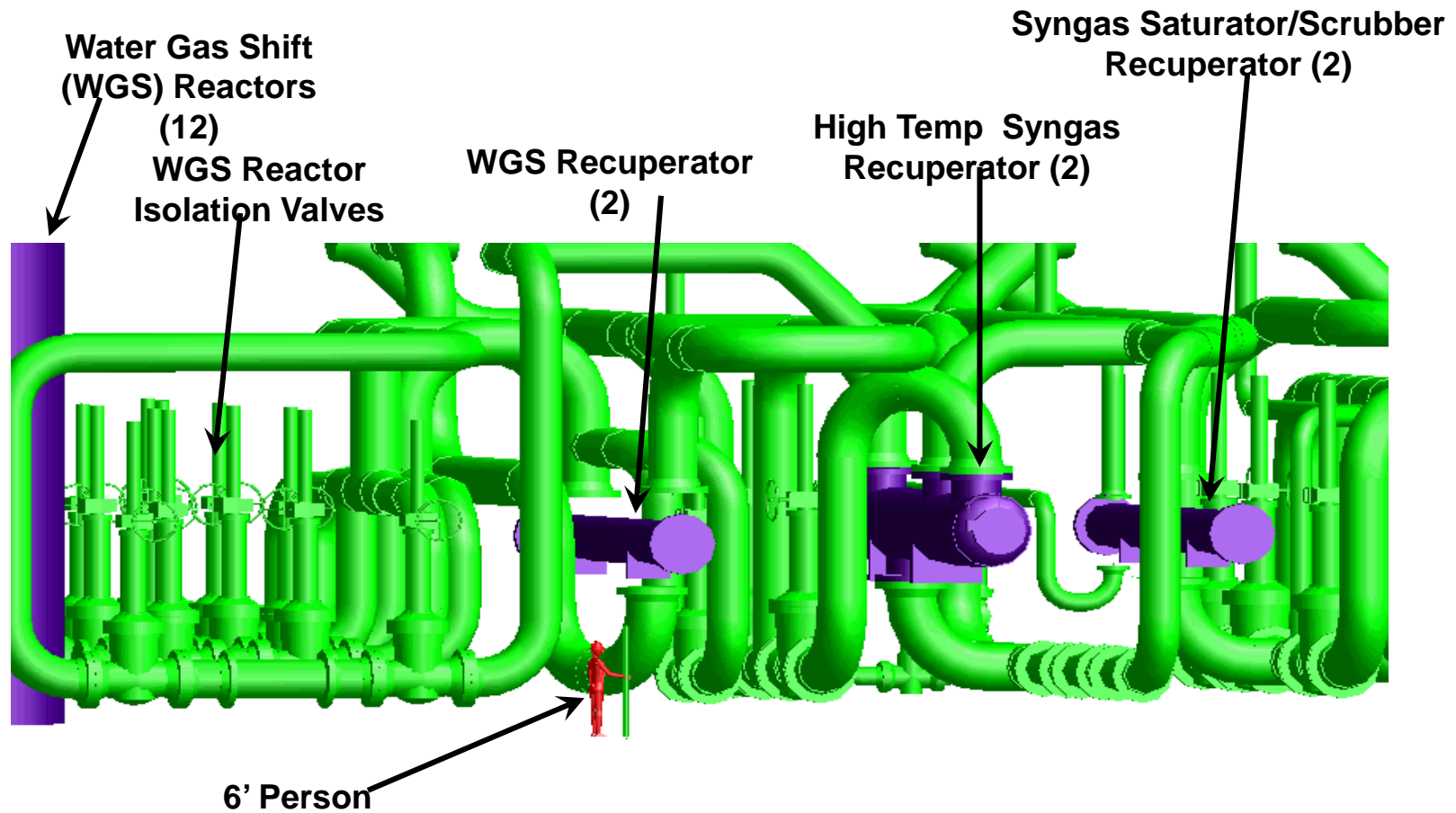
Kemper County TRIG™ 3-D Perspective



Kemper County TRIG™ 3-D Perspective

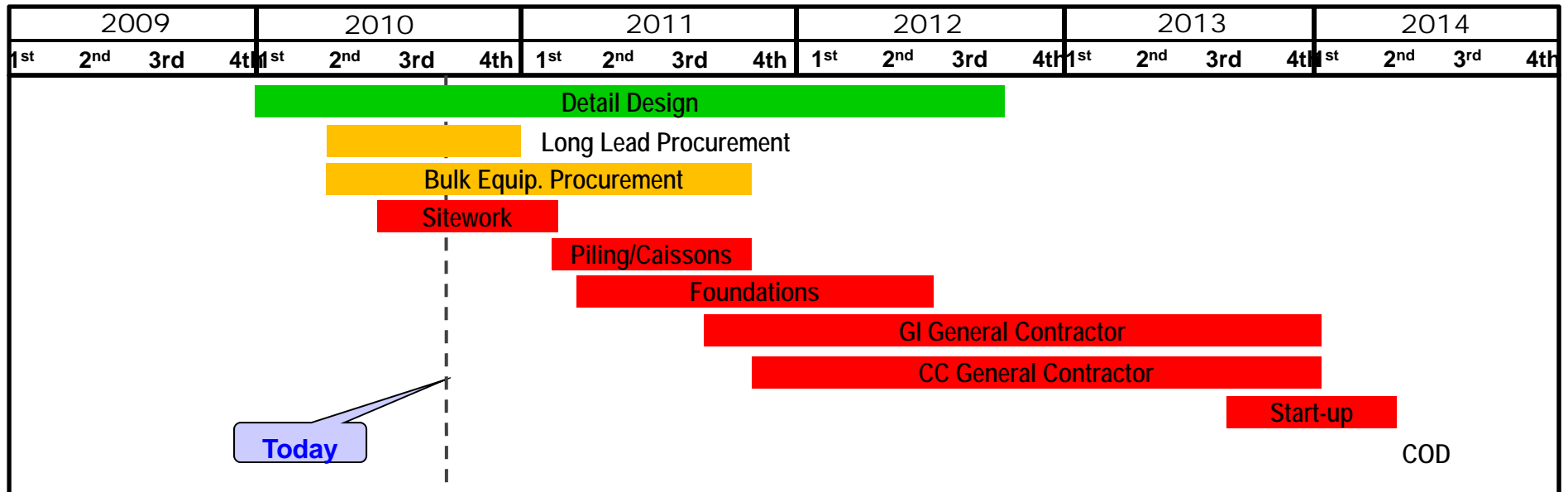


Kemper County TRIG™ (A Sense of Scale)



Kemper Status/Summary Schedule

- On June 3, 2010, the Mississippi Public Service Commission issued a Certificate of Convenience & Necessity for the project authorizing construction.
- Construction began after PSC certification.
- DOE has issued a Record of Decision on for the NEPA process related to CCPI funding.
- MDEQ issued the final PSD permit on March 9, 2010.



Kemper County Construction Mid-Oct 2010

Initial clearing & grubbing for TRIG™ site complete

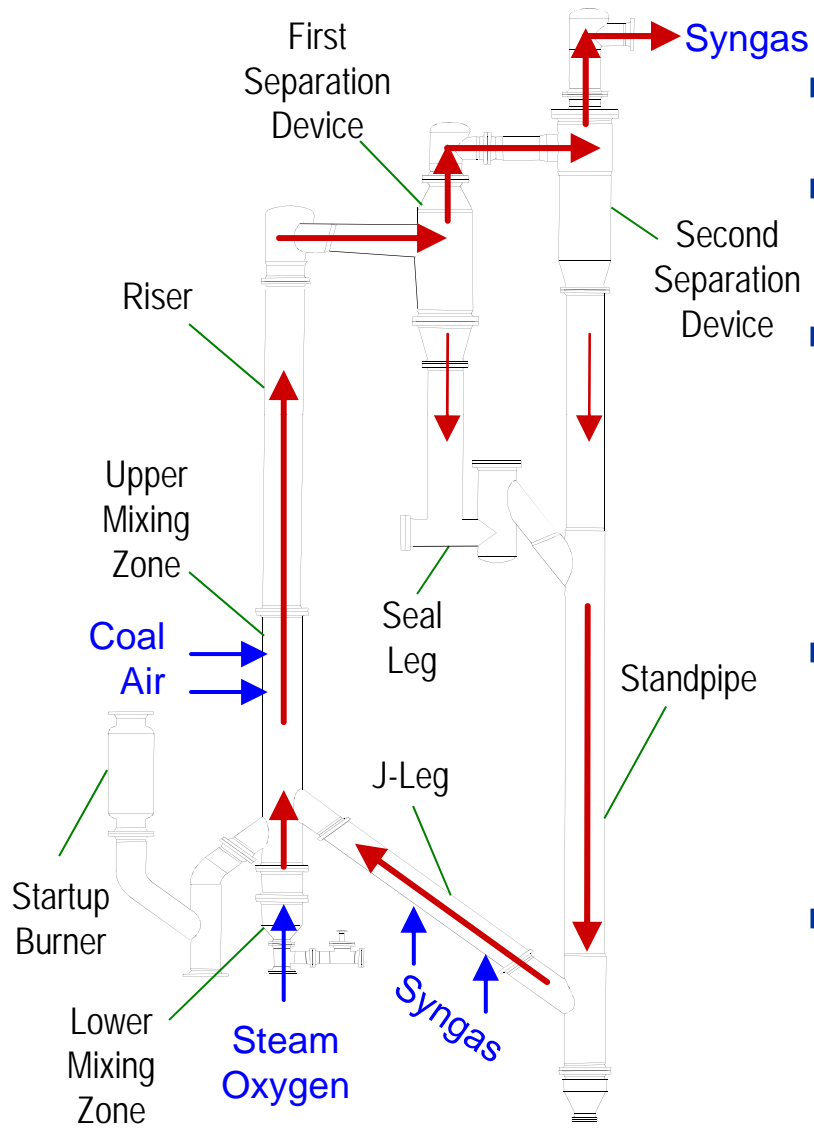
Earthwork to begin Week of 10/4

Foundation work to begin next year.

Majority of construction work slated for 2012.



TRIG™ IGCC Attributes / Advantages



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