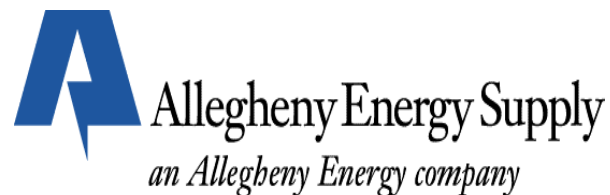


The Willow Island Generating Station Opportunity Fuel Project

Kathleen H. Payette, P.E.

Project Manager

Oct 24, 2000



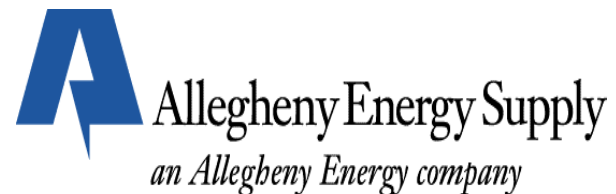
Project Title:

***Designing an Opportunity Fuel
with Biomass and Tire-Derived
Fuel
for Cofiring at
Willow Island Generating Station***



Overview of the Program

- Design, Construct and Demonstrate a Sawdust Firing System at Willow Island #2 Boiler
- Integrate the Sawdust Firing with Tire-Derived Fuel Firing for a New Designer Opportunity Fuel
- Integrate the Opportunity Fuel Cofiring with Separated Overfire Air for NO_x Management




Overview of the Unit

- Cyclone Boiler
 - Pressurized Operation
 - Scroll Feeders
- 188 MW_e Capacity
- Hot Side Electrostatic Precipitator
- Part of Pleasants-Willow Island Site




Willow Island Generating Station



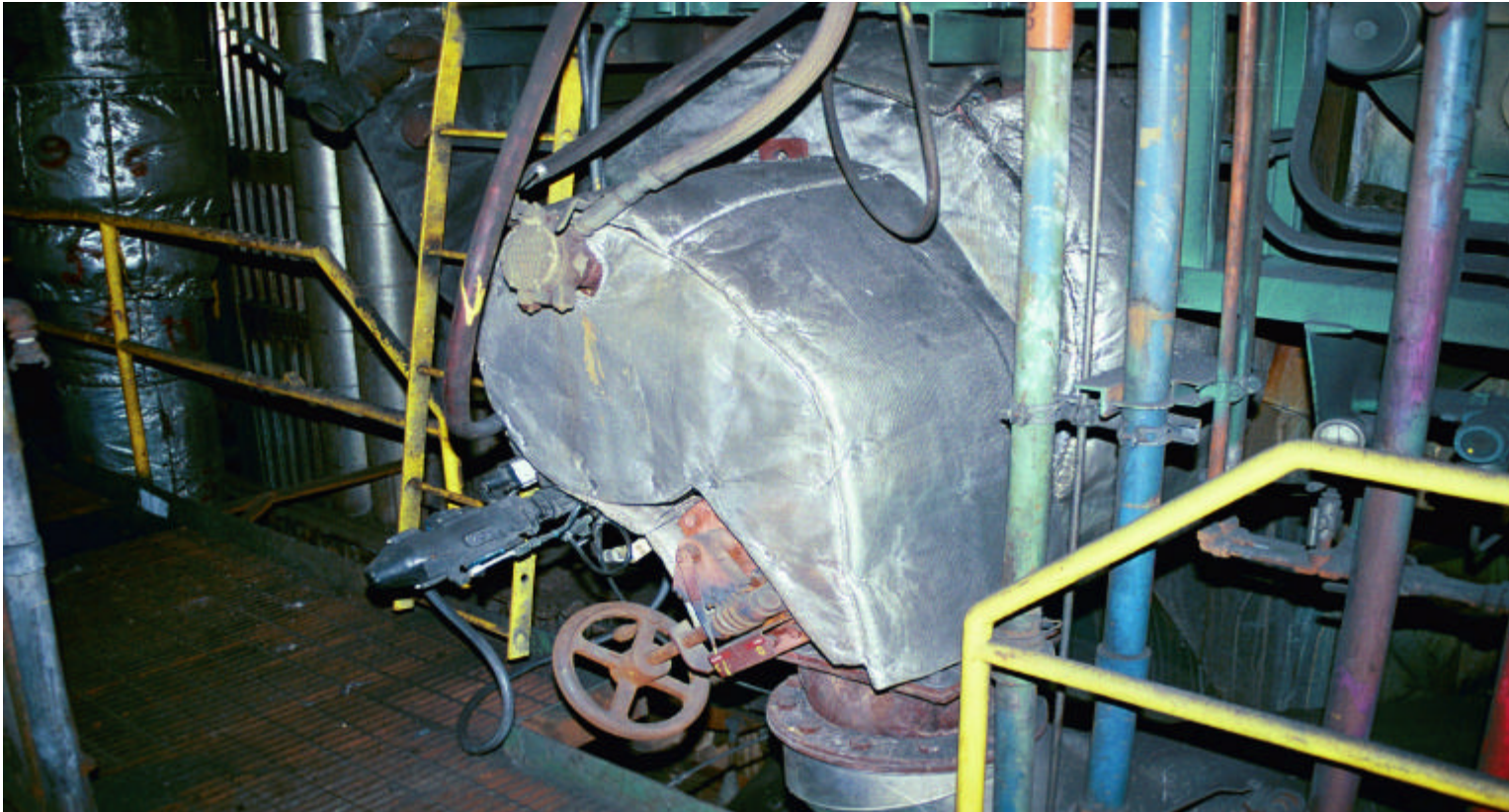
 Allegheny Energy Supply
an Allegheny Energy company

Willow Island #2 Boiler



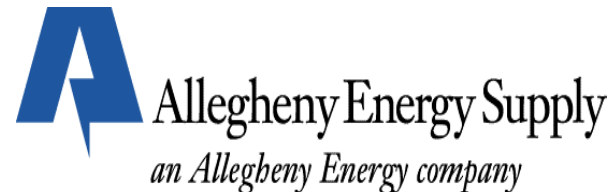
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One Cyclone Where Fuel is Fired



Objectives of the Project

- Enhanced NO_x Reduction
- Voluntary Fossil CO₂ Reduction
- Enhance Performance of the Hot ESP with Biomass Ash if Possible
- Generation of Renewable - Green - Power
- Support for Local Economic Development



Project Plan

- Detail the Influences and Synergies Between Sawdust, TDF, and Overfire Air
 - Identify Individual Influences on NO_x
 - Identify Synergies in NO_x Management
- Detail Influences of Sawdust Ash on Performance of Hot Side ESP
- Commercialize Designer Opportunity Fuel Process



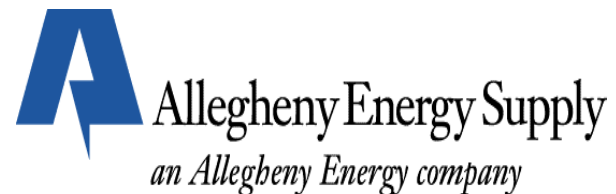
Elements of the Project

- Final Biomass System Design (feasibility and preliminary design are complete)
- Biomass System Construction
- Designer Opportunity Fuel Demonstration
 - Short Term Testing [various blends, settings]
 - Demonstration [Long Term] Testing

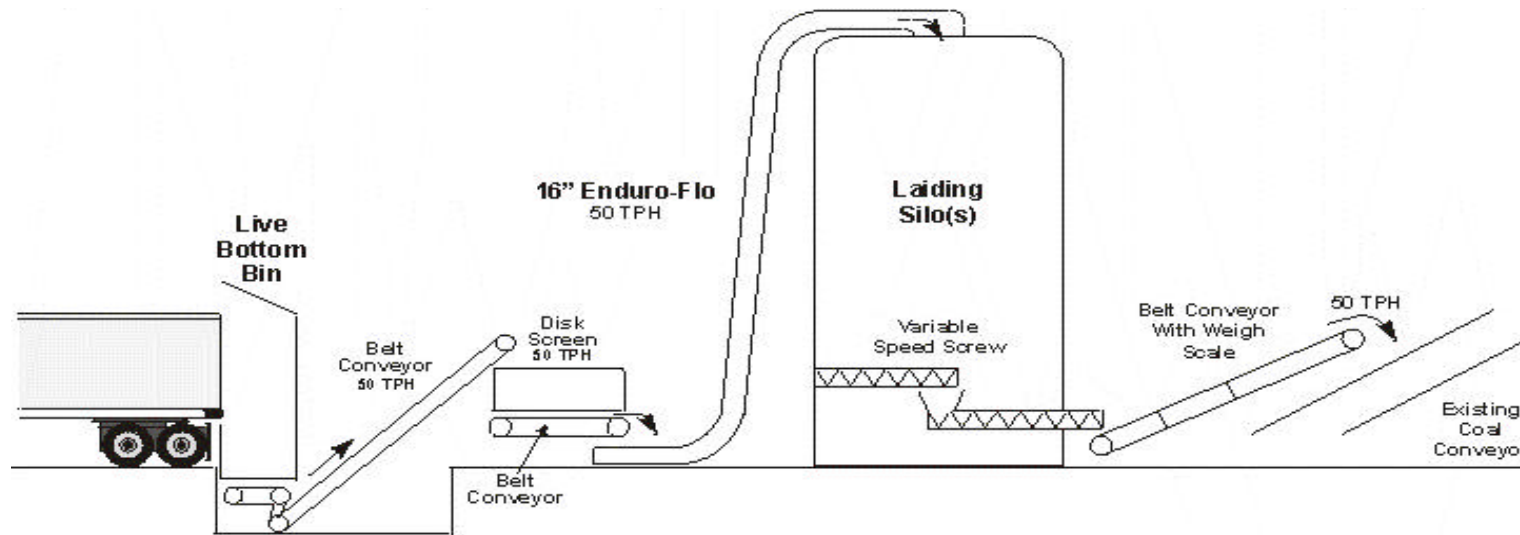


Progress to Date

- Installation of TDF System is Complete
- Installation of Overfire Air System is Being Completed
- Preliminary Design of Sawdust Element in the System is Complete
- Feasibility Assessment of Designer Fuel Project is Complete



Process Flow Diagram for Sawdust Element




Willow Island
85-100793-71
Flow Diagram
1240285.2

Sawdust Project Location - 1




Sawdust Project Location - 2



 Allegheny Energy Supply
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Willow Island Generating Station



 Allegheny Energy Supply
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Comparison of Fuels to be Burned

	Sawdust	Coal	TDF
PROXIMATE ANALYSIS (Wt %)			
Fixed Carbon	9.29%	51.96%	27.96%
Volatile Matter	47.71%	33.84%	55.64%
Ash	0.90%	7.09%	4.78%
Moisture	42.10%	7.11%	0.62%
ULTIMATE ANALYSIS (Wt %)			
Carbon	29.27%	72.41%	83.87%
Hydrogen	3.33%	4.71%	7.09%
Oxygen	24.30%	5.93%	2.17%
Nitrogen	0.08%	1.33%	0.24%
Sulfur	0.01%	1.42%	1.23%
Ash	0.90%	7.09%	4.78%
Moisture	42.10%	7.11%	0.62%
HIGHER HEATING VALUE (Btu/lb)	4828	12941	16250



Overall Project Schedule

Activity	Start Date	End Date
Selection of Fuels and Blends	9/1/00	12/1/00
Detailed Design	9/1/00	12/1/00
Construction	11/1/00	1/31/01
Short Term Testing	2/1/01	4/30/01
Demonstration	5/1/01	4/30/03
Reports and Closeout		5/31/03

Identification of Major Milestones

- Final Design Completion
- Fuel Blend Selection and Fuel Procurement
- Equipment Procurement
- Construction Completion
- Short Term Testing Completion
- Demonstration Completion
- Final Report



Additional Activities

- Performing Cofiring with Separate Injection of Sawdust at Albright Generating Station
 - 150 MWe Tangentially-Fired Boiler
 - Boiler Equipped With Separated Overfire Air and Low NO_x Firing System
 - Separate Pneumatic Injection of Biomass
 - Data for Comparative Assessment of Willow Island Demonstration



Expected Accomplishments - 1

- Detailed Understanding of the Mechanisms and Opportunities for NO_x Reduction with Biomass
 - Biomass Cofiring Alone
 - *Synergies With Other Opportunity Fuels*
 - Biomass Performance in Low NO_x Firing Systems [e.g., SOFA]



Expected Accomplishments - 2

- Evaluate Biomass Ash as Additive for Hot Side ESP Performance Enhancement
- Demonstrate Cost-Effective, Voluntary Fossil CO₂ Reduction Approach
- Demonstrate Cost-Effective Approach to Generating Renewable - Green - Power
- ***Key is Opportunity Fuel Synergies***



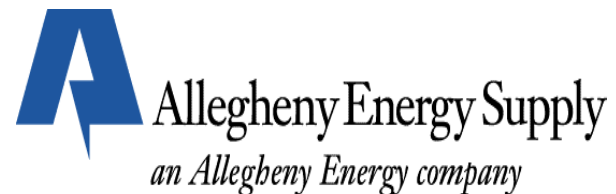
Projected Benefits

- Significant Potential to AE
 - NO_x Management Technique
 - Reduction in Greenhouse Gas Emissions
 - Reduction in SO₂ Emissions
 - Other Environmental Benefits



Project Participants

- Allegheny Energy Supply Co., LLC - Prime Contractor
- Foster Wheeler - Principal Subcontractor
- Specialty Subcontractors
 - S. Harding and Associates - Overfire Air
 - Cofiring Alternatives - Biomass Fuel



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