W.A. Parish Post-Combustion CO_2 Capture and Sequestration Project

2010 NETL CO_2 Capture Technology Meeting

September, 2010

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Project Highlights

- Owner – NRG Energy, Inc.
- Facility WA Parish Power Station Unit 7
- Cooperative Agreement between NRG / NETL signed May 7th 2010
- 60 MW equivalent carbon capture from coal-fired unit
- Post combustion carbon capture
- Utilizes Fluor's Econamine FG Plus^{SM} technology
- Sargent & Lundy providing engineering for balance of plant

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Note Worthy Project Attributes

- Fluor intends to test new solvents
- Testing Piperazine solvent (University of Texas)
- Employing Ramgen compression technology
- CO_2 production will be utilized for EOR
- Integrates high efficiency co-generation to provide the necessary steam

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EFG+ Process Overview

- The Econamine FG Plus^{SM} (EFG+) process uses an amine to recover carbon dioxide from flue gas sources.
- Fluor purchased the process from Dow Chemicals in 1988.
- There are 26 installations of the process – the most for any post combustion CO_2 capture technology.
- Fluor built the largest CO_2 capture plant in the world to date at Bellingham, MA – 20 ft Absorber.
- Current projects are recovering CO_2 for environmental/regulatory reasons. Therefore, plant sizes are much larger (> 1000's tons per day).

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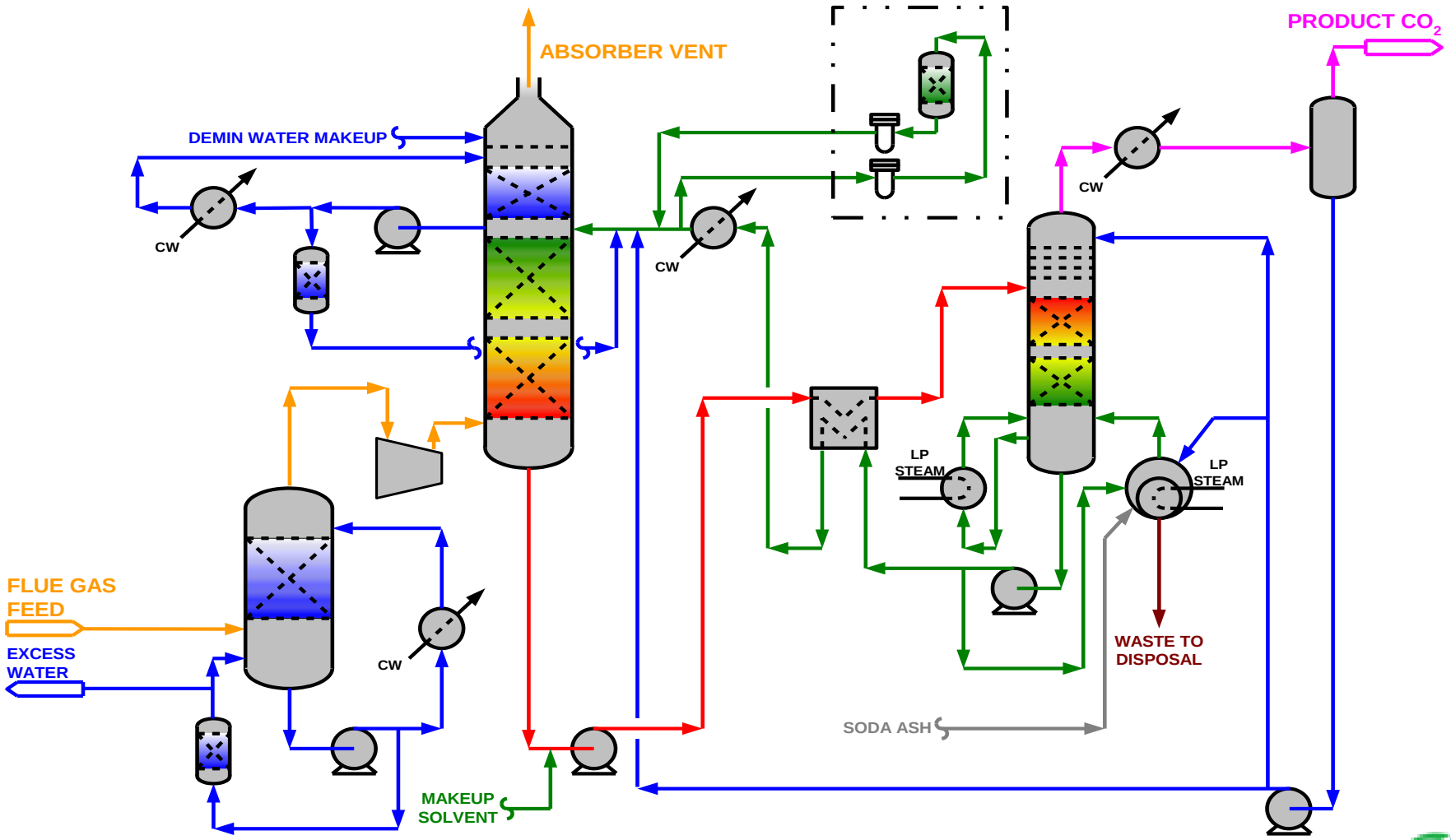
Typical Econamine FG+ SM Flowsheet



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Reference Plant: Florida Power and Light

Project Profile

- Plant location: Bellingham, MA
- Capacity 330 metric tons per day
- CO_2 Concentration: 3.5% v/v
- O_2 Concentration: 13 - 14% v/v
- 100% air cooled
- Product Usage: Food-grade CO_2
- Status: Continuous operation since 1991 with a 98.5% on-stream factor in 2004. Shutdown due to high natural gas price.

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Bellingham Plant Aerial View

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EFG+ Development

Fluor / E.On Demonstration Plant

- Flue gas from a coal-fired power plant
- 70 metric tons per day plant in Wilhelmshaven, Germany
- To be commissioned in 1st quarter 2011
- The process flowsheet at Wilhelmshaven closely resembles the NRG flowsheet.

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EFG+ Development

Fluor / E.On Demonstration Plant

- Many of the new features of the EFG+ process have been tested separately but they will be tested together for the first time at Wilhelmshaven. Some of these include:
  - Performance tests at normal and off-design conditions.
  - Performance testing of individual equipment items or systems.
  - Testing of various emissions reduction configurations.
  - Testing of different solvents.
- Results from the demo plant will hopefully allow Fluor to increase the energy efficiency of the EFG+ process.

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NRG Energy, Inc. WA Parish PCCS Project

- Project under the Clean Coal Power Initiative
- NRG's WA Parish Generating Station – 3,700 MW facility
  - 2,500 MW of coal-fired units
  - 1,200 MW of gas-fired units
- Parish PCCS Project: 60 MW carbon capture and sequestration demonstration facility
- CO_2 Production Capacity = 1,192 metric tons per day
- 90% design CO_2 capture rate

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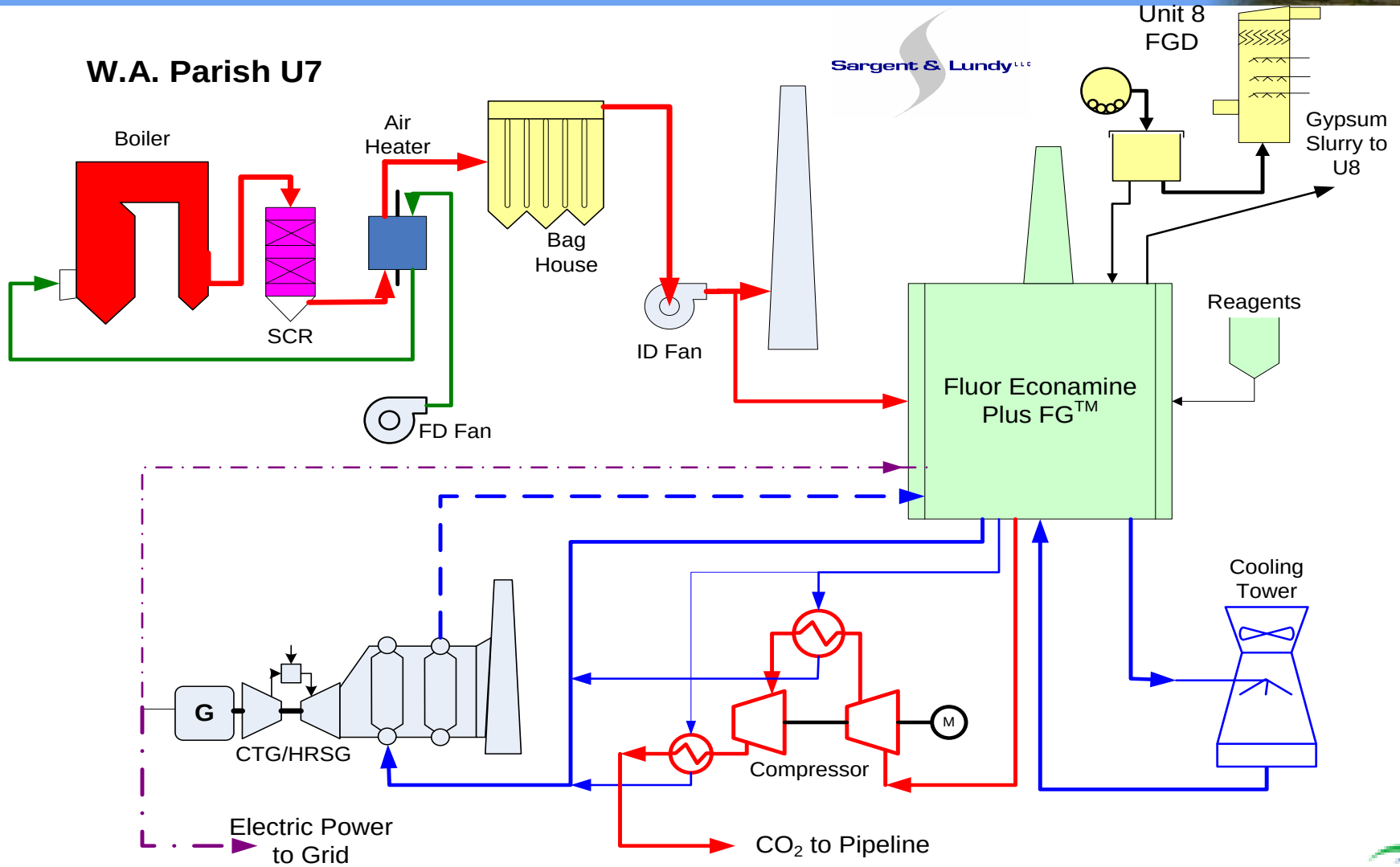
60 MW Demonstration Unit



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Technology Improvements for this Project

- Absorber intercooling
- Lean vapor flash / compression
- Improved solvent reclaiming system
- Testing of new solvents
- Integrated Sox trim removal / gas conditioning system
- Demonstrate an integrated gas turbine

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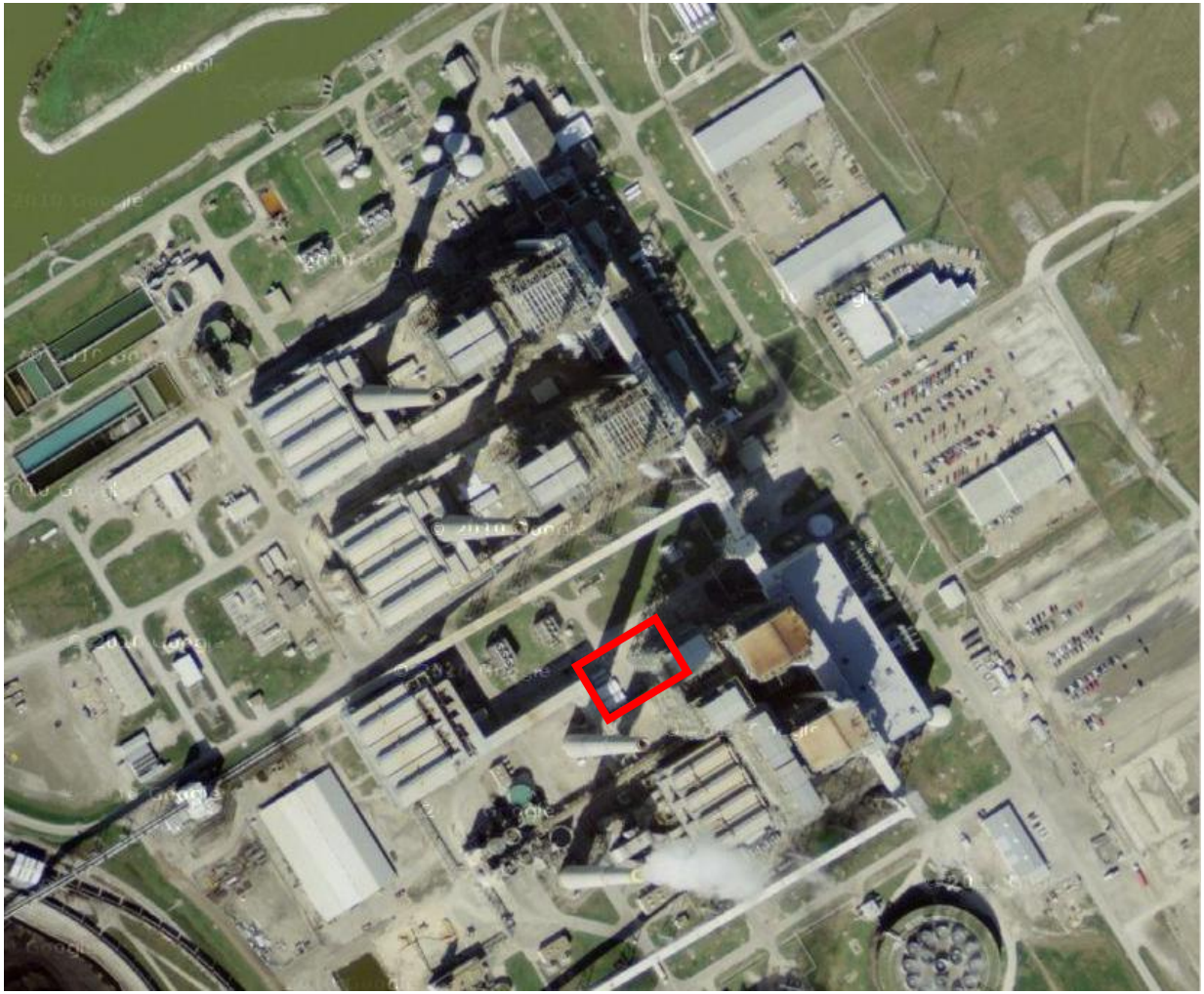
W.A. Parish Electric Generating Station
Location of Econamine FG Plus℠ Plant



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Site Photos

Site Photos

NRG WA Parish CCS Demonstration

Major Milestones

• Start FEED	May 2010
• Finish FEED	May 2011
• Start Detailed Eng & Design	Jan 2012
• Start Construction	Jan 2013
• Start Commissioning	Jul 2014
• Two Year Testing Plan	

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