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Cc:	Satish.Reddy@Fluor.com
Subject:	Econamine FG Plus Technology Information
Date:	Monday, August 05, 2013 11:31:01 AM
Attachments:	Plant Experience Table 2012 Non-Confidential.pdf Gastech Presentation - EFG+ Technology.pdf

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Aimee,
Following up on our discussion this morning, below are some addition/confirmation points from the Bellingham plant. Note that the Bellingham plant was considered part of the older EFG technology. We now offer significant technology enhancements and refer to it as EFG+ technology.

- Econamine FG (EFG) plant recovered CO2 from a partial slip stream of flue gas generated by the 300 MW gas turbine power plant.
- The partial slip stream of flue gas consisted of 13% of the total available flue gas generated by the power plant.
- EFG plant recovered 85% of the total available CO2 from the flue gas fed to the plant for a total CO2 capture capacity of 360 ton/day.
- Flue gas consisted of a very dilute CO2 concentration (3.1 vol% wet) and very high oxygen concentration (13.2 vol% wet)
- Plant included a liquefaction and purification unit to generate food-grade CO2.
- Achieved 98.5% on-stream factor during last 3 years of operation.
- Plant was 100% air cooled
- Zero-liquid discharge facility (i.e. any effluents generated had to be re-used in the system with exception to reclaimer waste)
- I was thinking of providing you with information on the Bellingham costs, but the problem with that is:
  1. The Bellingham plant was not designed to be as efficient as possible as it was required to consume a minimum quantity of steam
  2. Any such values are based on older outdated technology and the numbers are no longer meaningful. Advancements made in the last 10 years on the technology have significantly reduced operating costs.

  Rather, I looked up some operating costs that we figured for a more recent FEED study on a much larger CO2 capture plant which also captured CO2 from a gas turbine power plant exhaust. Unfortunately, I cannot give details of those costs but I can say overall that the Utility and Chemical costs worked out to approximately $31.50 / ton CO2 captured.

I've attached the latest experience list as I'm not sure this is what you've seen. Also, I'm attaching a presentation I gave at the Gastech conference end of last year in London to provide additional information on the technology.

Regards,

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(See attached file: Plant Experience Table 2012 Non-Confidential.pdf)(See attached file: Gastech Presentation - EFG+ Technology.pdf)

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