European CO_2 Test Centre Mongstad

Carbon Capture and Storage (CCS) Study

Customer: Aibel

Services Provided

- Process simulations
- Residue Catalytic Cracker (RCC) cyclone design
- Direct contact coolers (and associated equipment)
- Gas blowers

Benefits to Customer

- Confidence in the overall process design
- Verification of equipment performance
- Confirmation that required gas specification into the CCS equipment was met

Background

On the 12th of October 2006 Statoil and the Norwegian Government entered into an agreement to provide a demonstration plant for the investigation of carbon capture at Mongstad in a two stage process, through the establishment of The European CO_2 Test Centre Mongstad (TCM).

The overall goal of this project is to develop, verify and qualify CO_2 capture technologies for large-scale industrial production by development and construction of the CO_2 Test Centre.

The TCM project will consider two different CCS technologies; an amine-based process and a chilled ammonia process. The TCM plant, located in Norway on the existing Mongstad refinery, is supplied with flue gas from two separate sources; the new Combined Heat and Power plant (CHP) and an existing Residue Catalytic Cracker (RCC) on the Mongstad refinery. The overall design capacity of the test centre corresponds to a nominal annual production of 100,000 metric tonnes of CO_2. The CO_2 recovered from the two test facilities will initially be vented to atmosphere but later taken to a new custom designed liquefaction part of the full scale CO_2 capture plant.

Project Description

Aibel carried out the initial design of the RCC and CHP flue gas pre-treatment systems, following which Costain carried out the design verification by assessment of the following:

- The process simulations for the flue gas pre-treatment
- The flue gas cyclone design
- The CHP and RCC gas blowers
- The CHP and RCC direct contact coolers
- The CHP and RCC cooling water heat exchangers
- The CHP and RCC re-circulating cooling water pumps
- The control and shutdown philosophy for the flue gas system