Bioenergy Reference Project 4

Tachikawa Wood-Waste Handling System

In 1997, Tachikawa Forest Products NZ Ltd in Rotorua committed to installing a 8 MW_{th} energy plant to be fired on waste-wood products.

The choice of boiler proved a two-edged response to problem solving. While its primary aim was to boost kiln drying capacity, it has also cleaned up literally another issue. Tachikawa had a waste disposal problem to deal with. A big drawback with the existing heat system was that it could not burn enough green sawdust and also would not handle and burn the dirty bark and residues that fell off the log deck.

The majority of the biomass fuel required for the new $8MW_{th}$ energy plant is created as a by-product of the manufacturing processes performed on the Tachikawa site. The remaining biomass is trucked to site from other local wood processors.

The Solution

Easteel Industries won the contract to supply the biomass / wood waste fuelled hot-water boiler. The Easteel-built boiler uses a technology new in Australasia. The concept is internationally not new. It is a scaled-down version of the Detroit Hydrogate that Detroit Stoker have been building for Power Boilers in North America for 15 years. Key to the design is the company's patented water-cooled vibrating grate.

Easteel managed the new boiler project in conjunction with Tachikawa from the start, working with other suppliers such as Automation and Electronics and Brightwater Engineers whose contribution was the fully automated fuel-management system.

Brightwater Engineers designed, built, installed and commissioned an integrated fuel handling system, incorporating:

- A Saxlund International Pull-Floor type discharger system housed in a 200 m^3 covered fuel bunker. The Pull-Floor design allows fuel to be introduced to the bunker by a combination of truck-dumping, loader filling, and conveyor systems. The discharger system utilises four ladders and a levelling screw to ensure a consistent rate of discharge. The Saxlund International Pull-Floor discharger is economical both in terms of space and maintenance needs and can be adapted to many industries and products.

Produced with financial assistance of EECA

- An inclined truss-framed belt conveyor to provide the mixed fuel to the boiler surge bin. The conveyor was supplied complete with 600 mm oil resistant belt, belt scraper, weatherproof covers, shaft-mounted motor, chutes, conveyor supports, and a cover for the boiler surge bin.

So, instead of carting the residues and bark away, Tachikawa put it through a shredder, mix it with sawdust, and combust it. There's no pre-drying needed as the boiler handles wet sawdust and even yard sweepings with ease — normally something of a problem in areas where pumice type soils tend to clag up the conventional burners and create more maintenance problems.

The Benefits

- Reliable and consistent delivery of difficult fuel materials to the boiler system without spillage
- Ability to use waste products to produce process energy with associated cost savings
- Consistent discharge rate allowing downstream conveyors and storage to be sized exactly
- Simple, rugged, low maintenance equipment with low operating costs
- Ability to blend multiple fuel streams with good mixing
- Complete turn-key solution - able to provide design, construction, installation and commissioning services.

The Specifications

- Material Bark, sawdust, trimmings (hogged)
- Density 400 kg/m^3 (average)
- Method of delivery Truck / loader / conveyor
- Bunker storage capacity 216 m^3
- Bunker (w x l x h) 12.0 m x 6.0 m x 3.0 m
- Conveyor discharge rate 7 tonne per hour

Tachikawa pull floor bunker rams and discharge conveyor

For more information, contact Brightwater Engineers on 03 5435300, Fax 03 5435301,
Email inquiries@brightwater.co.nz or visit their website at http://brightwater.co.nz