

Detroit[®] Rotary

Seal Feeders

provide solutions for
(FPL) Florida Power
and Light Biomass
Facility

Case History



Detroit Rotary Seal
Feeders help to
improve efficiency and
reduce plant
maintenance hours

FPL Energy AVEC, an electric power generating plant located in Fort Fairfield, Maine, is a biomass facility fueled by burning wood waste generated from the area's forest products industry. The plant is designed to operate 24 hours a day, seven days a week, and produces 35 megawatts of electricity. This electricity is sold and wheeled through various transmission systems in the area.

Background

The plant's boiler system utilizes a traveling grate, spreader stoker to fire the wood waste fuel which produces a by-product of fly ash. The ash is collected in bottom ash hoppers and is then reinjected back into the boiler. The plant burns approximately 380,000 tons of wood fuel per year. The design steam output of the plant is 328,000 pounds per hour at 1,500 psig, 900 degrees Fahrenheit.

Problem

A problem which had continuously plagued the plant was their rotary valves. Rotary valves are utilized in several areas of the plant to feed, meter, and convey wood char and ash to various collection points within the plant. The wood char and ash contain a significant amount of sand, which is highly abrasive.

Plant personnel made numerous attempts to strengthen the feeders, which became costly and time consuming.

The original rotary feeders had motors that were side mounted and integrally designed with the feeder's gearbox. Vibration was a constant problem and a source of bolt failure. Due to the integral design of the feeder, when one component failed, others failed. Internal wear created by the abrasive ash and sand was a constant struggle. Side plate wear ultimately resulted in leakage. Plant personnel made numerous attempts to strengthen and beef up the feeders by welding the rotor tips and housing linings. This required machining to ensure proper clearances.

Aside from being very costly and time consuming, other problems resulted. After running the feeders for periods of time, heat would cause the feeder to warp. The rotor would bind on the housing liner and eventually seize. Since there were no shear pins in the feeder design, motors would burn up. Another shortcoming of the original feeder's design was the lack of clean out ports or inspection access. When plugging occurred the plant would encounter substantial amounts of downtime.

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"The Detroit Rotary Seal Feeder is a dream machine. It's built with the maintenance guy in mind,"

Kevin McKeen
Manager of
Maintenance
FPL Biomass
Facility



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Solution

The plant was determined to find a solution to their feeder problems. Although the plant operated Detroit Stoker Company (DSC) combustion equipment, they never thought of DSC in terms of a rotary valve manufacturer. Upon the recommendation of their DSC Service Consultant, the plant reviewed DSC's product and decided to purchase a Detroit Rotary Seal feeder.

Maintenance reviewed DSC's product literature and noticed the design features that addressed the very problems they had been experiencing over the past several years. DSC feeders were able to provide:

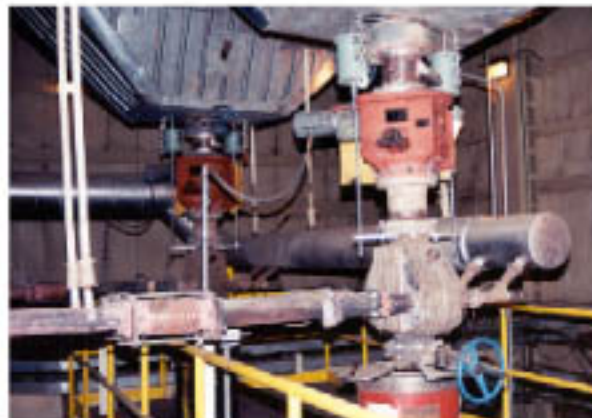
- **Self adjusting shoe/rotor**
- **Inspection ports located for easy access and visual inspection – side clean out covers**
- **Rugged design, built for hostile operating conditions**
- **Motor and gear box design with shear pin feature**
- **Easy to service, built with the maintenance professional in mind**



Removal of end cover plate of the DSC feeder permits access to rotor and rotor sealing assembly for maintenance without having to remove the feeder from the system. The access openings provided on the feeders allow FPL to conduct internal inspection, and the shear pin assembly, located on the driven sprocket of the rotor shaft, protects the drive mechanism against feeder jamming from foreign material.

Results

The FPL plant ordered their first DSC Rotary Seal feeder and in a matter of a few months they ordered their second. The following spring FPL ordered three more with the intention of replacing all their feeders with DSC feeders. FPL's maintenance personnel has not serviced the feeders since its installation more than two years ago. Prior to the Detroit Rotary Seal feeder installation, they found themselves rebuilding their feeders annually. The maintenance task has been shifted to operating personnel, freeing up maintenance resources for other more important duties.



For more information on Detroit Rotary Seal Feeder's, contact Detroit Stoker Company at 1-800-Stoker4 or visit their web site at www.detroitstoker.com