



Plant Location
Florida Power Development
Central Power & Light
Brooksville, FL

Quick Delivery of Abrasion Resistant Screws for Power Plant

General Description of the Application

Central Power & Light is a 70 Megawatt (MW) power plant owned by Florida Power Development that in 2012 was converted to burn biomass in place of coal to produce electricity. Biomass is a source of renewable energy and consists of a variety of organic materials from scrap lumber to certain crops. For Central Power & Light, the biomass consists of primarily wood chips and bark from local sawmills and paper mills. These bulk materials are stored in a large silo (called the Biomass Surge Bin) to provide a steady source of fuel for the boilers. Underneath the silo is a 4-screw live bottom screw feeder used to meter the biomass into two separate boiler lines. It is crucial that the boiler feed process remains consistent in order to optimize the boilers and efficiently produce power. When the feed system is unable to operate, downtime can routinely cost the plant up to \$100,000.00 per hour.

Design Parameters of Application

Product Type: Biomass Waste - Wood Chips, Bark

Material Density: 75 Lbs. per Cubic Foot

Conveyor System Capacity: 6,000 Cubic Feet per Hour

Duty: 24 Hours per Day, 7 Days per Week

Advantages Provided by KWS

Florida Power continually experienced premature failure of screws on the Biomass Surge Bin that was purchased from another manufacturer. The flights of the original screws were formed from an abrasion resistant alloy that would normally function well, but unfortunately, the flights were mounted on schedule 40 pipe which has a relatively thin wall thickness for a harsh, industrial application. Due to improper screw design, the high torque and significant deflection continually caused the center pipe of each screw to fail. The Florida Power maintenance department would be forced to splice the screws back together in order to keep the equipment running.

Florida Power contacted KWS and already knew about their exceptional quality and superior customer service due to a previous project. The Biomass Surge Bin needed three out of four screws replaced as soon as possible. Rising to the occasion, KWS manufactured and shipped the three replacement screws in four days after receiving the order. Screws that would normally have a five-week lead time were fabricated and shipped in just four days due to the KWS commitment to Florida Power and the ability to handle expedited deliveries. KWS has more manufacturing capabilities than any other screw conveyor manufacturer and utilizes lean manufacturing principals to eliminate wasted time and labor. Florida Power installed the new replacement screws and kept the Biomass Surge Bin running without interruption and costly downtime. Consequently, due of the expertise of the KWS Engineering staff, the new screws were not just replacements, but far superior to the original design.



KWS Manufacturing

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Special Features of KWS Design

Instead of using the thinner walled schedule 40 pipe that was used on the original screws, KWS manufactured the new 25-foot long screws on 10-inch schedule 120 pipe with a wall thickness of 0.844-inches. KWS also used ½-inch thick abrasion resistant AR400 flights that were continuously welded to the pipe on both sides by ASME certified welders. 100-percent inspection was performed by a KWS Certified Weld Inspector (CWI) to ensure that the screws were dimensionally correct and manufactured to very high KWS quality standards.

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Testimonial

"The screws look great! Quality, especially weld quality, is very important to us. And we were able to install them without any issues."

Rick Pellation – Florida Power Development



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Engineering
Manufacturing

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