

Lime Kiln ID Fan Upgrade Project

The Problem

In 2014, AirStream contacted an East Coast pulp mill presenting a unique approach to evaluating problems with dust build-up on the mill's No.1 and No.2 Lime Kiln ID Fans. Due to high vibration caused by scaly build-up, the fans were being cleaned every few weeks. During the evaluation process, both fans were identified to be operating at low efficiency, primarily due to the radial blade design. While offering intrinsically lower efficiencies, radial bladed fans are often selected for use in dusty applications because they are thought to minimize build-up.

The Upgrade Process

During initial plant visits, detailed information about the No.1 Lime Kiln ID Fan was gathered with the assistance of the mill personnel, including operating data used to select a design performance. Information about the existing fan housing, bearings, motor and coupling were obtained to be evaluated for reuse. In February 2015, AirStream returned to site to conduct performance testing, which provided a clear and accurate understanding of the existing fan performance and kiln system.

This data gathering process enabled AirStream to propose supply and installation of a new high-efficiency fan rotor capable of delivering 50,000 cfm with 29.69" WG static pressure rise. The existing fan housing, bearings, motor and coupling were confirmed to be suitable for reuse, while AirStream supplied new carbon ring shaft seals to minimize dust leakage onto the bearings. No modification of the fan housing was required.



Fig.1 The original fan rotor required sandblasting every 2-3 weeks to remove hard build-up.



Fig.2 The high-efficiency AirStream rotor can operate continuously for 1 year without requiring cleaning..

The Results

The turnkey project was ordered, and the new fan was installed by AirStream in March 2016. After 1 year of continuous operation, site personnel reported that the fan had not been required to shut down for cleaning since installation. The hard build up had been eliminated and 43 kW in VFD input power savings were reported. The verified results of the fan upgrade are outlined below. The mill engaged AirStream to supply the upgrade for the No.2 Lime Kiln ID Fan in early 2020.

Operating Parameter	Original Rotor	AirStream Rotor
Operating Condition Power	223 kW	179 kW
Design Condition Power	268 kW	224 kW
Cleaning Frequency	Every 2-3 weeks	Annually
Build-up Description	Hard, scaly, cleaning required sand blasting	Soft, easily washed off