

Optimizing Ash Evacuation System Performance



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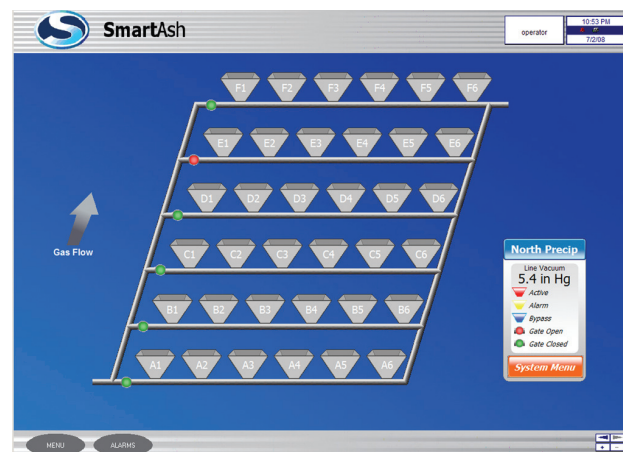
Optimizing Ash Evacuation System Performance

At the back end of an electrostatic precipitator (ESP) or baghouse/fabric filter operation, a fly ash evacuation system removes ash from hoppers and transports the ash to a storage silo or ash pond. Typically this process is considered secondary to the fundamental operation of a power generation utility or product recovery industry; therefore, the fly ash evacuation system is often overlooked or neglected until operational performance is compromised or equipment failures occur.

These failures can occur when the hopper evacuation system is not effectively filling and emptying ash from hoppers, allowing ash to build up on hopper walls, creating ratholes or bridging, and in the worst case, reaching high enough plugging levels to damage essential equipment—shorting out ESP sections, warping ESP plates or baghouse structures, or causing high differential pressure in a baghouse.

Since operators, technicians and plant management cannot see inside hoppers, physical walkaround inspections to check on ash collection equipment and performance have historically been the only solution. However, with the introduction of new software systems, plant personnel can have a dynamic, real-time view of the hopper evacuation system and its performance right on a desktop computer. Built-in monitoring and reporting capabilities improve troubleshooting and provide the information and tools to prevent or quickly remedy ash system issues.

The remote availability of this data enables on-the-spot monitoring and interpretation of fly ash system operating data and reliable hopper level detection—without wasting

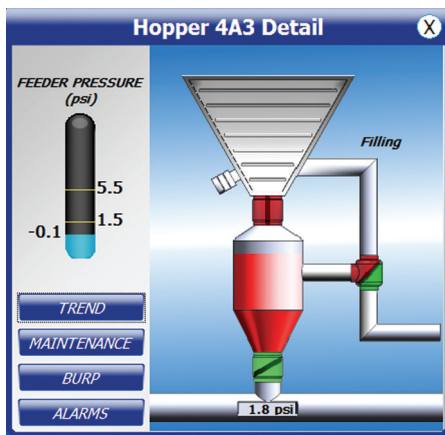


Overview screens for a software-based ash evacuation monitoring, trending and troubleshooting software system: pressure system (top) and vacuum system.

valuable time manually checking equipment and improving safety by avoiding potential exposure to hot ash. The software quantifies the ash collected by a hopper, sending users high-hopper-level alarms before it's too late. There is no longer a need for high level sensors on every hopper—reducing costs and maintenance. The monitoring and data collection software system, easily interfaced between the ash system and a programmable logic controller (PLC) or distributed control system (DCS), utilizes proprietary algorithms to optimize hopper sequencing and ash collection system performance to reduce costs, maintenance and downtime for plant operations.

A software system installation is justifiable based on low installation costs, easily updated technology and the prognostic value of high hopper alarms before a performance or equipment problem occurs. A customized justification for installing the software is derived by quantifying potential costs attributable to:

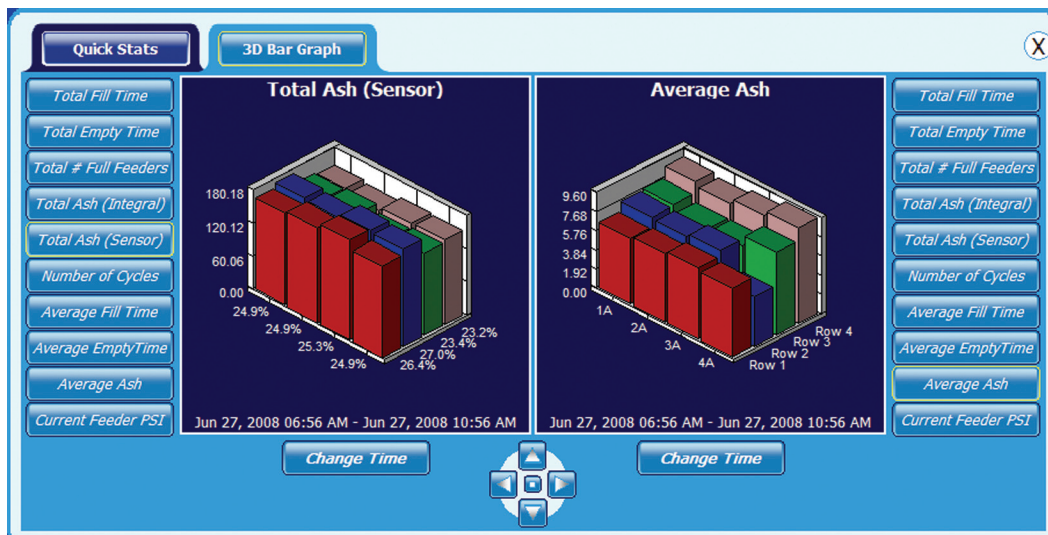
- Lost power generation (MWs) or lost product recovery
- Repairing damage from high hoppers
- Emergency contractor services to clean out hoppers
- Safety issues caused by needing to clean out hot ash to clear hoppers
- Purchase of hopper-level sensors



Hopper detail for a pressure system.

Other specific operational scenarios in which a monitoring, trending and troubleshooting software system installation may be a better choice include:

- When evaluating the purchase and maintenance of nuclear or other high-level hopper detectors, purchasing an advanced system with trending troubleshooting capability will provide the high-hopper information and a full range of other diagnostic performance tools that high-level detectors do not provide
- When changing fuels or seeking more ash system capacity
- If adequate system capacity already exists, consider how a sophisticated software-based system can reduce component wear and reduce energy consumption
- If PLC or DCS ash system controls are budgeted, consider incorporating a monitoring, trending and troubleshooting software system for additional functionality for about the same amount budgeted for the control system alone



3D bar graph detail on a software-based ash evacuation system depicts all data available for each hopper.

SmartAsh 7.0 Ash Evacuation Software System

Hopper Evacuation Monitoring, Trending and Troubleshooting

SmartAsh software from Neundorfer offers accurate, real-time monitoring and detection of high hopper levels, avoiding high-hopper ash problems that could compromise system performance or damage electrostatic precipitators or baghouses. Typical results include:

- Reduced load restrictions/de-rates
- Reduced opacity excursions
- Increased system capacity or reduced energy consumption as a function of optimized ash pulling

The patented SmartAsh technology automatically optimizes hopper sequencing to improve ash handling system performance while reducing costs, maintenance and downtime.

For diagnosing and managing precipitator or baghouse ash collection performance, the SmartAsh 7.0 system delivers a cost-effective optimization alternative to more traditional approaches.



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