



Customer
Coal-fired power plant

Industry
Power generation

Application
Conveying — paddle conveyor

Rexnord Solution:
Autogard 400 Series Torque Limiter

Total Annual Savings
\$16,897

For a detailed cost analysis for your application, contact your local Rexnord Representative.

Torque Limiter Delivers 82% Savings for Coal-Fired Power Plant

Challenge

A coal-fired power plant utilizes a paddle conveyor to transport coal from its bunkers to a pulverizer, and the coal is periodically misted with water to satisfy environmental rules requiring the control of coal dust. The moist coal repeatedly collects on the paddles and jams the conveyor, and as a result, the plant had grown increasingly concerned about resulting damage to the entire conveyor system:

- The conveyor jams frequently broke the conveyor chain and paddle attachments, causing three unplanned downtime events per year for their replacement.
- These sudden increases in torque pushed the system beyond its design point, and could eventually damage more expensive components such as the drive gearbox (an approximate \$100,000 replacement).
- The plant needed a way to minimize the expense incurred for each jam and prevent further damage to the conveyor system.

Rexnord Solution

While the jams resulting from the moist coal could not be avoided with the installed conveyor and dust suppression system, Rexnord provided the gearbox shaft of the conveyor system with an Autogard® 400 Series Torque Limiter, which disengages the drive components during a jam and has a unique reverse-to-reset mechanism to minimize downtime. The torque limiter is adjusted to allow the conveyor to operate under its normal conditions, but protects the system from any sudden high torque incurred by a jam. This solution:



Autogard 400 Series Torque Limiter

- **Eliminates high chain replacement rates.** Since the chain links no longer absorb the high torque, the jams do not result in broken chain linkages and paddle attachments several times a year.
- **Minimizes maintenance and lost production.** While jams still occur with the moist coal, the operator can simply clear the jam and reset the torque limiter.
- **Removes risk of a damaged gearbox.** The torque limiter is designed to protect the expensive drive from torque spikes in the rest of the system.

Rexnord Solutions and Savings in Action

Since installing this Rexnord solution, the customer has:

- Reduced their total cost of ownership by \$16,897 annually.
- Minimized time and costs during maintenance events.

Calculating the Annual Total Cost of Ownership (TCO)

Rexnord worked with the customer to determine the current costs compared to the TCO using the Rexnord solution. Factors considered were:

- Acquisition costs.
- Installation costs.
- Costs of lost production.
- Maintenance costs.

Annual Cost Analysis Breakdown (in \$USD)

Acquisition Costs	Purchase Price	Expected Life (years)	Units Installed	Total
Without torque limiter	\$0	-	0	\$0
Autogard Torque Limiter	\$750	10 years	1	\$75
Annualized Savings				-\$75

Installation Costs	Installation Cost	Installation/Year	Units Installed	Total
Without torque limiter	\$0	-	0	\$0
Autogard Torque Limiter	\$4,022	0.1	1	\$402
Annualized Savings				-\$402

Lost Production Costs

Reduced unplanned downtime to replace conveyor chain and paddle attachments.	Events/Year	Downtime/Event	Downtime Cost/Hour	Total
Without torque limiter	3	1 hour	\$6,250	\$18,750
Autogard Torque Limiter	3	10 minutes	\$6,250	\$3,125
Annualized Savings				\$15,625

Reduced Maintenance Personnel Costs	Events/Year	Maintenance Resources	Maintenance Cost/Event	Total
Without torque limiter	3	4 people	\$600	\$1,800
Autogard Torque Limiter	3	2 people	\$17	\$51
Annualized Savings				\$1,749

Rexnord Solution Annual Savings Summary

Total current cost	\$20,550
Total proposed cost	\$3,653
Total savings	\$16,897
TCO reduction percent	82%

Total Cost of Ownership Annual Savings: \$16,897