



W H I T E P A P E R

# STEEL MILL REVERSING DRIVE MOTOR TORQUE MONITORING

Understanding and controlling shaft torque for severe applications

## Application: Steel Mill Reversing Drive Motor Torque Monitoring

### Understanding and controlling shaft torque for severe applications

**Industry:** Steel

**Product:** [AT-4400](#) Precision Torque Digital Telemetry System

**Parameters measured:** Torque

When a large steel manufacturer needed to replace their tandem 6000 HP main drive motors with even larger motors, they made the decision to pro-actively monitor the torque of their 41" diameter rotors to allow maximum steel throughput without damaging the new motors and shafts.

In maximizing output, steel mills typically subject drive motors and shafts to damaging torque excursions that both shorten the life of the mill and cause frequent and expensive maintenance outages. The severe environment ruled out the use of slip rings, and past problems of data interference with older FM telemetry ruled out their re-use. The precision AT-4400 induction powered digital torque telemetry system was chosen for the monitoring. The AT-4400 system was chosen due to its ruggedness, high resolution (16 bits), sample rate and bandwidth, and low EMI susceptibility (due to digital circuitry design).

The mounting design for the transmitters entailed the use of four ¼-arc segments of a glass laminate split clamp-on collar. The induction power/data stationary pickup coils were similarly designed. The AT-4400's remote Receiver provides 0 +/-10V output signal. Welded strain gage coupons for the shafts were installed in order to provide a quickly installed turn-key system, and to improve the availability of the mill if gage replacement is required. (PCB Load&Torque can supply strain gaging on site). Telemetry monitoring of drive shafts provides a dependable way of continuously measuring dynamic torque. The AT-4400 provides 16 bit resolution digitizing at a rate of 26495 samples per second.



The four arc segments of a similar system's rotating Transmitter.



Assembled rotating transmitter with AT-4400 receiver and lengthy pickup-to-receiver coaxial cable.



Typical stationary induction power / data pickup for large diameter shafts.



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#### About Accumetrics

Accumetrics Inc., an MTS Systems Corporation, designs and assembles digital telemetry systems that transmit sensor data from rotating structures using wireless techniques, preserving the integrity of the data even in environments with high levels of electromagnetic interference.

We can provide a range of solutions from single channel products, such as strain gage torque measurements, to advanced multichannel systems that transmit data from hundreds of sensors.

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