

MINING INDUSTRY

Root Cause Failure Analysis Solves Bearing Problem



- **Application** = Ventilation Fan
- **Motor Type** = AC Induction
- **Manufacturer** = Toshiba
- **HP** = 200
- **Voltage** = 575
- **RPM** = 1800
- **Enclosure** = TEAO

The Challenge

A gold mine in Ontario, Canada has over 50 ventilation fan motors ranging from 100 HP to 800 HP. Many of these motors were experiencing premature bearing failures. Depending on the fan motor, unplanned plant downtime costs were as high as \$60,000 per hour.

The Solution

IPS technicians conducted a root cause failure analysis on one of the failed motors, and determined that the failure was due to electrical currents passing through the bearings. It turns out the customer had recently started using adjustable speed drives on some of their fan motors, which was determined to be the source for the electrical currents. IPS recommended the following upgrades when repairing the motor:

- Replace old bearings with insulated bearings
- Install shaft grounding brush in the motor



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Electric shaft current can lead to bearing failure due to the formation of fluting in bearing raceways.



Shaft grounding brushes provide electrical contact to the motor shaft to reduce or eliminate induced shaft currents.

TOTAL COST OF OWNERSHIP (TCO)



The Savings

Even though the IPS recommended upgrade of adding the shaft grounding brush and insulated bearings increased the repair cost by approximately \$9,000, the customer has not experienced any repeat bearing failures to its ventilation fan motors. Assuming a conservative unplanned downtime rate of \$25,000 per hour for a failed ventilation fan, and approximately 12 hours to replace the motor, the customer has eliminated \$291,000 of unplanned lost production.

COST ITEM	COST DESCRIPTION	ANNUAL TCO	IPS SOLUTION
Production	Unplanned Downtime (Plant)		
	Total events (Qty. / Year)	1	0
	Reduction in Capacity (\$ / Hour)	\$25,000	\$0
	Avg. time per event (Hours)	12	0
	Sub-Total (\$ / Year)	\$300,000	\$0
Materials	Repair		
	Total events (Qty. / Year)	1	1
	Avg. repair cost (\$)	\$11,000	\$20,000
	Sub-Total (\$ / Year)	\$11,000	\$20,000
1st Year TCO =		\$311,000	\$20,000
IPS SOLUTION SAVINGS =			\$291,000

The Conclusion

Eliminating even one premature failure over the life of the motor adds up to significant savings. IPS's root cause failure analysis and repair recommendation to install insulated bearings and a shaft grounding brush solved the customer's problem. They are now using this as their site standard for all ventilation fan motors. If you are currently not using IPS for service and repair of your electric motors and generators and would like to receive more information about TCO documented savings, contact your local IPS sales representative or visit www.ips.us or www.ips.ca.



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