

# PRIMARY METAL MANUFACTURING

*Preventive Maintenance Reduces Unplanned Downtime*



- **Application** = Compressor Motor
- **Motor Type** = AC Induction
- **Manufacturer** = GE
- **HP** = 350
- **Voltage** = 4160
- **RPM** = 3600
- **Enclosure** = TEFC

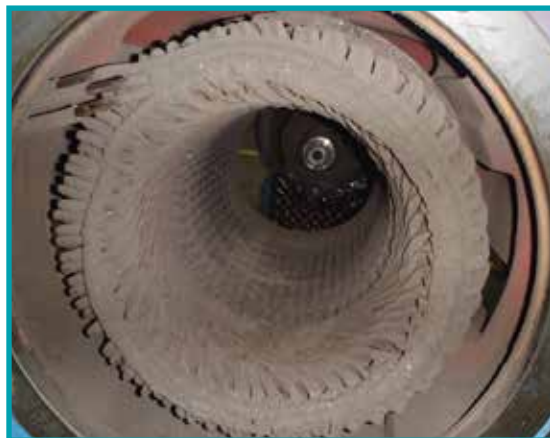
## The Challenge

A Midwest steel mill experienced a winding failure to one of its three 350 HP compressor motors. The mill had to reduce its production at a cost of \$20,000/hour. Per the customer all three compressor motors have been in service for approximately 10 years without any significant preventive maintenance services performed.

## The Solution

During inspection and rewind of the failed motor, IPS technicians noticed that the air gap between the stator core and rotor was full of contamination, and several lamination vent holes were plugged with debris. IPS determined that the stator winding insulation failed due to high temperatures resulting from insufficient cooling of the motor caused by the excessive debris and contamination. IPS provided the following preventive maintenance solution for the other two compressor motors:

- Reconditioned the remaining motors to remove all of the debris and contamination from the lamination vents and air gap, thus preventing additional winding failures, expensive rewind costs and unplanned downtime.
- IPS field service established visual inspection and preventive maintenance schedules for all customer critical motors.



*Stator winding failure due to overheating caused by contamination and debris plugging the lamination vents, and filling up the air gap between the stator core and rotor.*



*IPS reconditioned both motors, including the safe removal of contamination and debris, in order to prevent future winding failures and costly motor rewinds.*



# TOTAL COST OF OWNERSHIP (TCO)

## The Savings

During the course of recondition, IPS noticed that both motors were experiencing the same contamination issues, and that the laminations were also showing signs of overheating. By reconditioning, IPS was able to save both motors from becoming rewinds, an approximate savings of \$30K, or 15K each. The customer also avoided an additional \$240K in unplanned downtime (\$20K/Hour x 6 hours x 2 motors) which occurred during the first failure and would have repeated itself if the other two motors were not reconditioned.

COST ITEM	COST DESCRIPTION	ANNUAL TCO	IPS SOLUTION
Production	<b>Unplanned Downtime (Plant)</b>		
	Total events (Qty. / Year)	2	0
	Reduction in Capacity* (\$ / Hour)	\$20,000	\$0
	Avg. time per event (Hours)	6	0
	<b>Sub-Total (\$ / Year)</b>	<b>\$240,000</b>	<b>\$0</b>
Labor	<b>Unplanned Downtime</b>		
	Standard Labor Rate (\$ / Hour)	\$74.50	\$0
	Time to conduct (1) PM Event (Hours)	42	0
	PM Occurences - (X / Year)	2	0
	<b>Sub-Total (\$ / Year)</b>	<b>\$6,258</b>	<b>\$0</b>
	<b>Preventive Maintenance (PM)</b>		
	Standard Labor Rate (\$ / Hour)	\$0	\$74.50
	Time to conduct (1) PM Event (Hours)	0	42
	PM Occurences - (X / Year)	0	2
	<b>Sub-Total (\$ / Year)</b>	<b>\$0</b>	<b>\$6,258</b>
Materials	<b>Repair</b>		
	Total events (Qty. / Year)	2	2
	Avg. repair cost (\$)	\$35,000	\$20,000
	<b>Sub-Total (\$ / Year)</b>	<b>\$70,000</b>	<b>\$40,000</b>
<b>1st Year TCO =</b>		<b>\$316,258</b>	<b>\$46,258</b>
<b>IPS SOLUTION SAVINGS =</b>			<b>\$233,742</b>

\* Issue did not shut the operation down, but reduced production

## The Conclusion

The customer has scheduled other motors to be pulled for recondition by IPS during planned maintenance periods. The steel mill has been running for a long period of time without any additional unplanned downtime from reconditioned motors. If you are currently not using IPS for preventive and predictive maintenance of your electric motors and generators and would like to receive more information about TCO documented savings, contact your local IPS sales representative.

