



# IRVING TISSUE

## LES PAPIERS IRVING

Date: December 19 2005

Dear John,

We installed a Roll Handling line in our facility around March 2004. The system includes seven Rockwell Power Flex 70 AC variable speed drives. The drives basically run conveyor and are scattered in the machine, however they are all fed from the same supply and the closest transformer is a 4160/600V 2500KVA with 5.52% impedance. Unfortunately we experienced about nice drive failures in 10 months which caused a lot of downtime and production issues.

In March 2005 we installed a Dranetz-Bmi PP1 power monitor at this machine to understand the issues and the reason for drive failure.

In addition we also sent a failed drive to Rockwell for failure analysis. Here is the summary:

The PF70 drive incorporates the use of a relay with a resistor connected in parallel configuration to accomplish the precharge operation of the drive. When power is applied to the drive the relay is in an open state causing to be limited through the resistor. Once the precharge has been completed the relay closes taking the resistor out of the circuit. Arcing to the contact suggest that a sag or interruption of power had occurred where the power returned within a short amount of time causing the current inrush to flow through the relay contacts. There was also an issue of drive fuses blowing, which cause most likely when power was applied when the relay was welded in the closed position. This is due to the fact that with the relay in the closed position the drive will not precharge and the bus capacitors will appear as a short to the line power when they are discharged. The current surge could cause input fuses or circuit breakers to clear. In addition, the drives are being fed from a 2.5MVA supply transformer with no additional impedance insulated in front of the drives.

In May 2005 we purchased surge suppressors and harmonic filters from International Innovative Systems and installed a Surge suppressor for the PLC and the MCC that fed the drives. We also installed a Harmonic Filter in series to the input of the machines power supply. Since then we had absolutely no issues with the drives or fuses clearing.

I would like to thank you for your help and the products that you introduced to us.

Sincerely

Ehsan Behboudi  
Electrical Engineer

