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 VFDs.

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 2500KV A with 5.52% impedance. Unfortunately we experienced about nine 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 current 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 contactor suggests that a sag or interruption of power had occurred when 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 was caused most likely when power was applied to the relay welded in the closed position. This is due to the fact that with the relay in the closed position will not precharge and the bus capacitors will appear as a short to the line power when they are discharged. The current surge causes the input fuses or circuit breakers to clear. In addition, the drives are being fed from a 2.5MVA supply transformer with no additional impedance installed in front of the drives.

In May 2005 we installed TPS surge suppressors 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 John Shamess of International Innovative Systems for his technical assistance and the products that he introduced to us.

Sincerely,

E. Behboudi

Ehsan Behboudi
Electrical Engineer