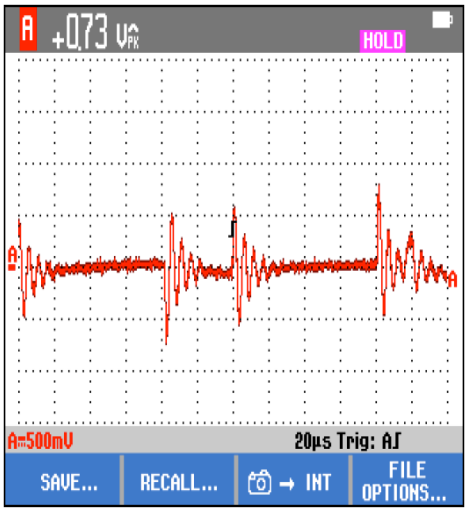
Topeka Electric Motor Repair Inc.
605 SW Lane St. Topeka, KS. 66606

This test data is from Rolling Meadow Gas To Energy Plant (Waste Management) in Topeka, Kansas, Topeka Electric Motor Repair, Inc. (TEMR) was asked to come to Rolling Meadows Gas Plant to test for High Frequency Current on The 250 hp Fuel Gas Compressor, FGCM-1

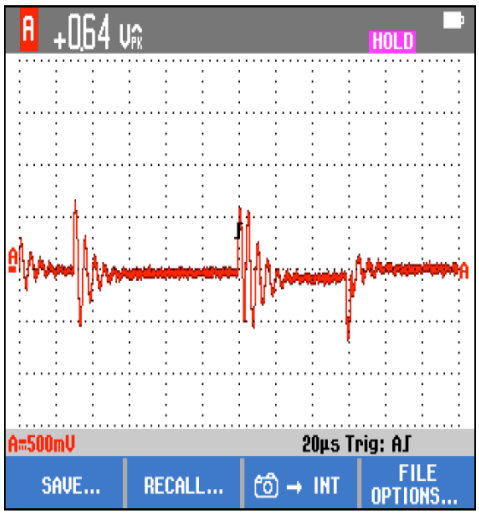
Testing is performed with the Fluke 190-204 meter and a Rogowski coil for measuring the High Frequency current.

The readings on the charts/tests below were taken on a 250 hp Cutler Hammer SVX 9000 mounted in a Freedom Series 2100 Motor Control Center, 250 hp Weg motor. It has a Trafotek line reactor and a MTE load reactor. Incoming voltage is 460 vac.

The pictures above are of the Motor control center.



readings taken on T leads before load reator.
test # 20 09-02-15



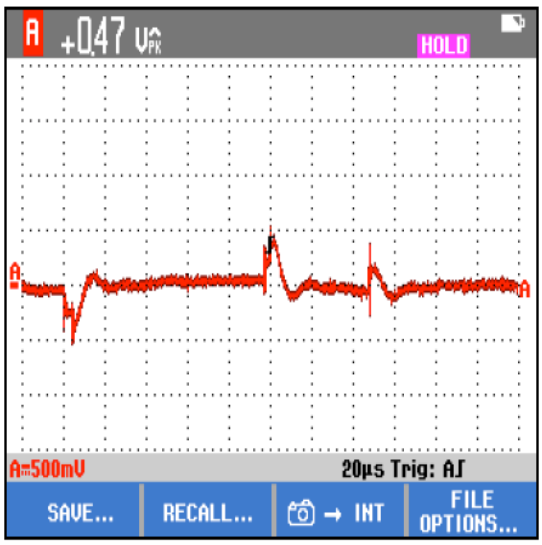
reading taken on T leads after load reactor/with no cores.
test # 19 9-02-15

The above test shows the amount of High Frequency current that is being generated from the drive on to the T – Leads. Also known as Common Mode leads.

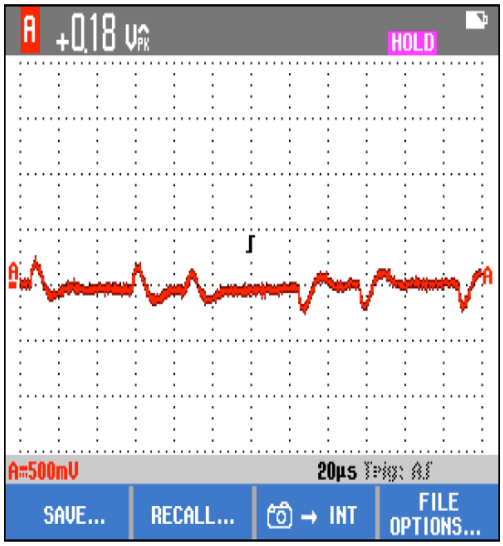
The conversion from volts to amps is: volts divided by .05. This is the constant for the Rogowski coil.

On test # 20 we were picking up .73 peak volt. On the T -leads before the load reactor. On test # 19 on the T-leads after the load reactor we had a peak voltage of .64 volt.

Test # 20 - .73 v divided by .05 = 14.6 amps of high frequency current. On test # 19 - .64 v divided by .05 = 12.8 amps of high frequency current on the T – leads (common mode leads). This difference of 1.8 amps of current is showing the efficiency of the load reactor. This is a difference of 12% reduction in the high frequency current.



readings taken on T leads before reactor, with coolblue and nala installed.
test #24 09-02-15t



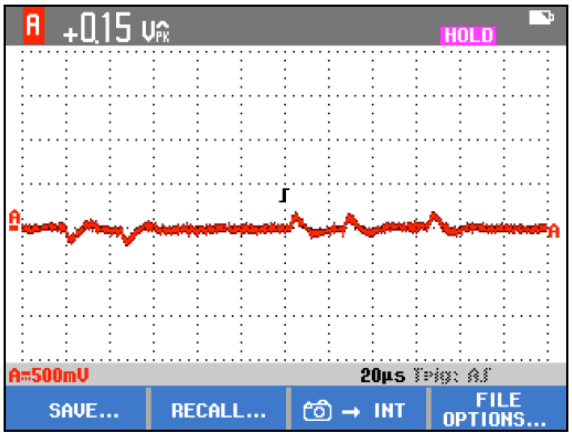
reading taken on T leads after load reactor. with coolblue and nala cores installed.
test#22 09-02-15

The above charts/test show the amount of High Frequency current on the T- leads before and after the load reactor.

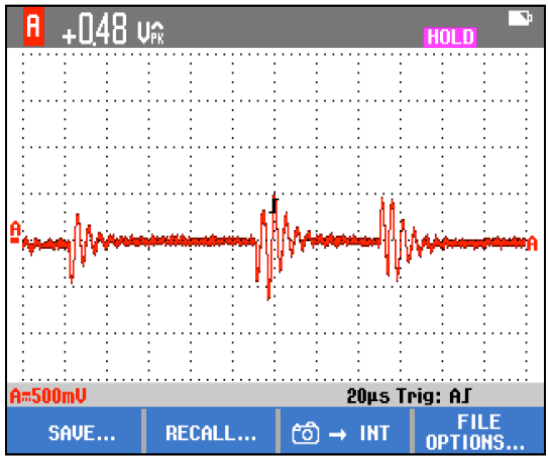
Test # 24, readings were taken on the bottom side of the VFD,(T-leads) before the load reactor, with the CoolBlue and NaLa cores installed. There was a peak volt of .47 volt. This converts to .47 divided by .05 = 9.4 amps.

Test # 22, readings were taken on the T –leads after the load reactor and with the CoolBlue and NaLa cores installed. We had a peak voltage of .18 volt. This converts to .18 volt divided by .05 = 3.6 amps of high frequency current.

Test # 19 & Test # 22 were taken on the T-leads after the load reactor, with and without CoolBlue and NaLa cores installed. This was a reduction of 71% in the High Frequency current that was removed from the Common Mode leads.



readings taken on the ground wire with coolblue and nala cores installed.
test# 23 09-02-15



reading taken on ground wire, from motor to drive, no cores.
test # 21 09-02-15

The readings on the above graphs/test were taken on the ground wire, from the motor to the VFD, with and with out the CoolBlue and NaLa cores installed.

Test # 21 was with no CoolBlue or NaLa cores installed. There was a peak voltage of .48 volt. This converts to: .48 volt divided by .05 = 9.6 amps of High Frequency current on the ground wire from the VFD to the motor.

Test # 23 was with the CoolBlue and NaLa cores installed on the T-leads. There was a peak voltage of .15 volt. This converts to .15 volt divided by .05 = 3 amps of High Frequency current on the ground wire. This was a reduction of 68% of High Frequency current on the ground wire.

With the use of shaft grounding brushes, this same current is still being sent to earth ground. It was just being redirected from passing through the motor bearings, to being passed through the shaft grounding brush to ground. Removing the High Frequency current is also a benefit to the motor windings.

In Summary: We need to evaluate this theory.
With the increasing use of VFD's, the problem with the High Frequency current/and EMI-RFI noise is going to become more prevalent. There will be more issues with a metal detectors, sensors, meters, gauges, electric motor bearings, conveyor bearings, Phantom shut downs,(false error codes) on the VFD's, etc. By using the grounding brushes, there has been no correction to remove the High Frequency current (also called Frequency noise or Sigma currents), they are still present. By redirecting the High Frequency current to the ground wire, you have created the issues seen in the test. What is the possibility that all of these issues have turned all of these manufacturing plants in to a big capacitor waiting to discharge, to damage the motor bearings, motor windings, reek havoc on sensors, meters, pick up sensors, etc.