April 29, 2009

To:

Kristen Walli
Board Secretary
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street
Suite 2700
Toronto, ON M4P 1E4

From:

Lantz Control Systems Inc
Lorne Lantz
2088 Perth Line 56, R. R. #2
Wellesley, ON N0B 2T0
Ph: (519) 656-2249
Fax: (519) 656-2221
Cell: (519) 574-6455
E-mail: lantzl@cyg.net

Board File Number: EB-2007-0709

Herein are my comments to the "Proposed Amendments to the Distribution System Code" released March 31, 2009

Regards

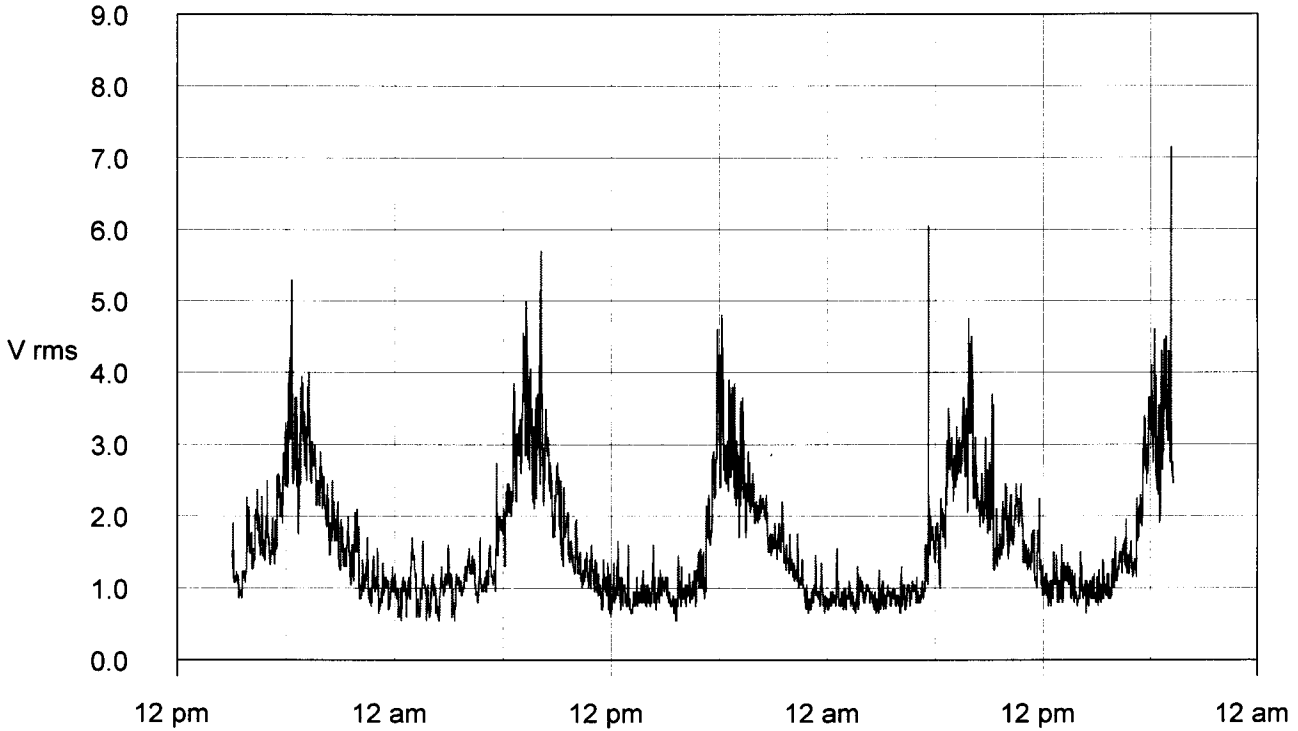
Lorne Lantz

Response to OEB Proposed Amendments to the Distribution System Code. Board File Number: EB-2007-0709.

I see most of the testing procedures on cow contact voltage in the Proposed Amendments to Farm Stray Voltage Distributor Investigation Procedure, as **A MAKE WORK PROJECT**. The many test points needed by the test procedure indicates how varied the results are in cow contact readings. This leads to confusion as to making a final decision with this testing method. I know longer use cow contact voltage to determine the problem. I go directly to the source to measure voltage and current coming onto the farm. Data loggings show that the voltage on the primary neutral varies throughout the day, (see Data Logging Primary Neutral Voltage). At chore time the primary neutral voltage can be 4-5 times higher than through the day and night. Cow contact readings taken at normal working hours (9-5) will record the lowest voltage, meanwhile higher voltage readings that occur during chore time will be not recorded, and this includes the very important time during which the cows are being milked.

In my response to the discussion paper and the proposal to amend a code, I spoke of large amounts of currents traveling from the primary neutral onto the farm secondary neutral to the bonded farm's grounding system. Large new dairy barns that meet ESA's code for bonding of the grounding system provide a very low resistance to earth. This low resistance increases the current onto the farm and reduces the voltage on the primary neutral. In some cases, the primary neutral voltage is reduced below the 1 volt level. (Refer to data logging Low Farm Gr. Resistance). This is one method that Hydro One uses to lower their voltage on the primary neutral. They drive in more ground rods which

PRI. NEUTRAL VOLTAGE

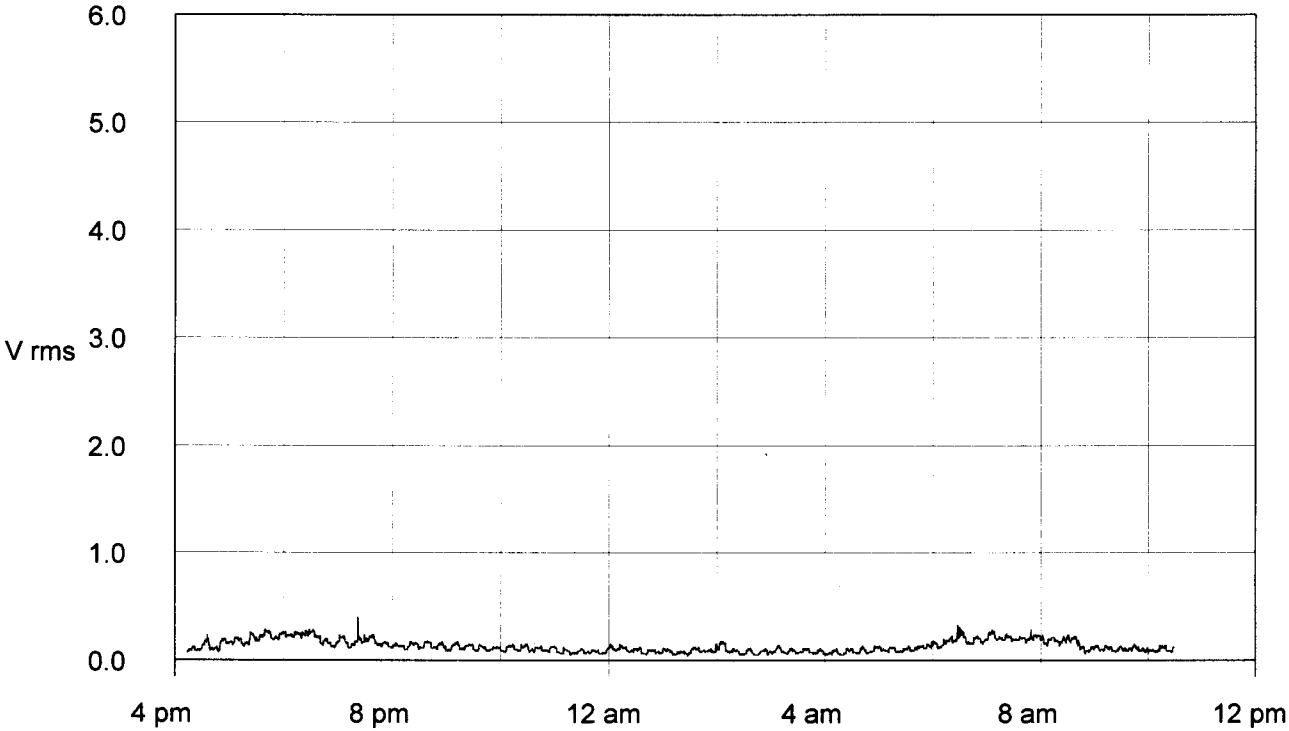


Start:4/1/08 03:01:05 pm
Logger No:7424
Points:6691

Max:7.15
Min:0.55
Average:1.62

THIS DATA LOGGING SHOWS HOW THE PRIMARY NEUTRAL VOLTAGE VARIES OVER A 48 HOUR PERIOD .

LOW FARM GROUND RESISTANCE TO EARTH



Start:1/23/08 04:13:44 pm
Logger No:7623
Points:4674

Max:0.40
Min:0.04
Average:0.13

THIS DATA LOGGING SHOWS A VERY LOW VOLTAGE ON A FARM GROUNDING SYSTEM .THE MEASURED RESISTANCE OF THE GROUNDING SYSTEM TO EARTH WAS .2 ohms . ACCORDING TO ANY COW CONTACT READINGS AND CALCULATIONS THERE SHOULD NOT BE A PROBLEM WITH STRAY VOLTAGE . A CURRENT MEASUREMENT TAKEN AT .26 VOLTS SHOWED THAT THERE WAS 1.3 AMPS OF CURRENT COMING BACK ONTO THE GROUNDING SYSTEM FROM HYDRO' S PRI. NEUTRAL .

decreases the resistance to earth which increases the current to earth and reduces the primary neutral voltage. This can further be explained by using the formula for Power.

$$\text{POWER} = \text{VOLTAGE} \times \text{CURRENT}$$

$$P = E \times I$$

$$P = R \times I \times I$$

$$P = R \times I^2$$

Power will remain the same at any one point in time so when you reduce the resistance, you increase the current which in turn decreases the voltage.

My point here is that you are using **Ohm's Law** to calculate current at a cow contact point, but the voltage has already been reduced by the low resistance of the farm grounding system. You **CANNOT** dispute **Ohm's Law**. If the values you use in the formula are altered before you start, you can show that there is no problem with stray voltage, yet the farm is flooded with current which goes undetected and the farmer still complains that there still is a problem related to stray voltage and current.

It is the current that does the damage to the livestock in the long term. Cattle that die on farms with stray voltage, show no known cause of death when an autopsy is performed at Guelph. This is a low level electrocution that affects the animal's electrical system in the u Amp range. Testing for current coming onto the farm's grounding system can be done with a **Fluke 360AC Leakage Current Camp Meter**. To perform this test, measure the current on the secondary neutral with the power shut off to the farm. This reading will reflect Hydro's current coming into the barn without any farm contribution. I firmly

believe that there should be a limit set for all current coming back onto the farm from Hydro's primary neutral as near to zero as possible.

It is not fair to the farmer to follow your recommended procedures of testing for cow contact when the low resistance of the farm and the varied voltage of the primary neutral, alter the values you base your calculations on when using **Ohm's Law**.

Every Primary Neutral that returns current back to the sub-station develops a voltage drop on that wire. Here again **Ohm's Law** shows that the resistance of the wire, times the current equals a voltage potential. Therefore every farm that does not have an Isolation devise is subject to the stray voltage and current. When a livestock farmer requests a Dairyland Isolator to protect their farm, it should be installed by Hydro One and the cost of the Isolator would be covered by the farmer. The cost of the Isolator would be far less than the losses that farms have occurred over the years due to the stray voltage and current related problems. It is high time that we stand up and protect our livestock farms from being used as ground rods by Hydro One. The next big challenge will be to get the OEB to recognize Hydro's earth current hot spots that are devastating Ontario farms.