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

Quote File: **EB-2007-0709**

From:
Ross and Darlene Brindley
RR#6,
82328 Council Line
Goderich, ON **N7A 3Y3**
Telephone: (519) 524 – 9747
Email: rjbrindley@scsinternet.com

20090427

To Ms. Walli:

Herein are our comments of the "**PROPOSED AMENDMENTS TO THE DISTRIBUTION SYSTEM CODE**" that the Ontario Energy Board released in March 2009.

Sincerely,

Ross and Darlene Brindley

I would like to take this time to thank the Ontario Energy Board for allowing us to make our comments on the Proposed Distribution System Code.

H.3 SAFETY (2) - If an investigator reasonably believes that a significant or immediate safety …
Our Comment: I understand the investigator playing it safe from potential hazards and harm, BUT when the farmer is finding unusual health effects on the animals in his care, and he and his family are getting shocks, chest pains, headaches, and unusual nose bleeds, etc. this should trigger a **priority response** from the investigator. The immediate action of the investigator is necessary to try and prevent any further damage to the animal and human health on that farm.

H.4.7 Investigation Report (2) the written report shall….
Our Comment: When writing these reports, the investigator should remember, that the farmer is **NOT** an electrical engineer nor is versed in electrical terminology and needs the report or cover letter to be in laymen's terms (no short forms ie. NEV, PT) but the data collected will have the short forms, as per the regulated forms.

H.4.7 Investigation Report (3) - …shall be made available to the livestock farm customer *upon request*.
Our Comment: Because the farmer has requested a farm stray voltage test to be done **on his/her farm,** the written report should **automatically** be sent to the farmer. When the farmer is waiting for some type of reprieve from the damage that stray voltage is causing, the written report could be of help to the local farmer's electrician as they work together with the utility company to fix the problem.

H.5.1.2 Farm Stray Voltage Test
(8) Test Duration and Continuity-…recorded over a period of not less than forty-eight consecutive hours….
Our Comment: To record over not less than 48 consecutive hours is good IF something is showing up, but when the farm stray voltage is **POSSIBLY** from a wind farm or the wind farm transmission lines (thru induction), then we would like to make some possible suggestions:

- The investigator will make sure there is adequate power generation on the transmission lines
- If the wind is low or moderate OR if the wind farm has lowered the output of generation (like: the wind is strong but power output is low MW and CURRENT for some maintenance work) a retest should be done
- When the neutral's NEV has a similar profile as the current on the wind farm collector feeders (transmission lines) but because the generation output is low, it is harder to profile the similarities, the investigator should be very prudent to get the "real time paid" output for the time of the comparison for the farm stray voltage data.
- The investigator might have to do several different recordings, if there is a possible wind farm connection, to get a "clear" picture of what is going on and possible where this farm stray voltage is coming from and who is responsible for it and how it might be fixed.

H.5.2.1 Distributor Contribution Test
(3) Time of Test - This test shall be performed at the same time of day as the times of highest ACV found in the Farm Stray Voltage Test.
Our Comment: **Timing is important** in some situations but not all.

- The investigator **MUST** be able to understand why the farmer is requesting a certain time for testing, and he/she must be able to make a judgment call, as per, when the best time to

do a test depending on each individual situation… IF the stray voltage is in the area of a wind farm and the wind is low or none existent at the time he/she is doing the investigative testing, then the results will be like was shown in my first attachment.

- Please understand that with wind farms the most generation is in the winter months, but it is much easier for the investigator to work around a farm yard in the summer months, this is where I am speaking to the fact of the **right time and conditions** to do the testing.
- But also, if the stray voltage is say from, variable speed fans in a barn then the fans would have to be on or off to have the stray voltage show up on the tests.

H.5.3. Phase 3 Procedure

H.5.3.1 Distributor Contribution Confirmation Test & Calculations

(2) **Procedure** - The investigator shall repeat the Distributor Contribution Test and shall for that purpose make measurements at the same locations as used for the original….

Our Comment: TIMING- We do need to restate this point again…

- The investigator **MUST** be able to make a judgment call, as per, when the **best time** to do a test depending on each individual situation…
- **IF** the stray voltage is in the area of a wind farm and the wind is low or none existent at the time he/she is doing the investigative testing, then the results will be like was shown in the first attachment.
- Please note that with wind farms produce the most generation, in the winter months

H.5.3.2 Final Farm Stray Voltage Test

(1) Purpose – The purpose of this test is to determine the impact of a distributor's remediation activities on farm stray voltage.

Our Comment: There is nothing between phase 2 and phase 3 say

- WAYS that may be implemented to correct the farm stray voltage problem
- Who must correct the problem (if it is coming onto the farm from another source)
- HOW LONG they have to get the stray voltage under the regulated allowable limits.

PLEASE NOTE: Attachment **1: (6 pages)**

- **Nothing has changed,** on the farm, between the first and second attachments, EXCEPT that the wind farm generation was higher in the second attachment. (Stronger winds)
- This report was given to us, from Hydro One, on November 05, 2008, an example of the required report…here is what happens when an investigation **was NOT done under the RIGHT CONDITIONS**
- In fact, we where still having animal health problems (the **Bull was bleeding from his nose**) in that time period, so that in itself tells us, as farmers, something is terribly wrong.
- Waiting 2 ½ months for a written report is like a lifetime, and we HAD requested the report, especially when livestock are involved. As you can see from the attachment 1 below the investigations finished August 18/08 and we got the report dated November 05/08.

hydro one

Hydro One Networks Inc.
P.O. Box 130
Beachville, Ontario
N0J 1A0

Tel: 800 961 1159 Ext: 3238
Fax: 519-482-5059
Cell: 519-440-9003
FBC: 800-957-7756

Customer Name Ross Brindley
Address 82328 Council Line, Colborne
Town/City, Ontario
Area Code 519
Date November 05, 2008

Attn: Mr. Brindley

Re: Stray Voltage Investigation – Initiated on June 24, 2008

Hydro One has completed the investigation regarding your Stray Voltage concern at the following service address: 82328 Council Line, Colborne

Hydro One made investigative visits to the above service address on June 24-27, 2008, August 07, 2008 & August 14-18, 2008

The Hydro One distribution standards require that the Neutral to Earth Voltage not exceed 10V. Further, OMAFRA recommends that the Stray Voltage limit shall be 1V for livestock.

The Neutral to Earth Voltage measurements taken by Hydro One at the above service address confirm that the Neutral to Earth Voltage for the Hydro One system and the customer system does not exceed 10V. Based on the Stray Voltage - Neutral to Earth Voltage Ratio (SV/NEV) of .05 the Stray Voltage does not exceed 1V.

Chart(s) of the Neutral to Earth Voltage measurements for each of the Hydro One system and the customer system are attached to this letter.

If you have any further questions please feel free to contact us at any of the numbers listed above.

Sincerely,

[redacted]
Meter Technician
Hydro One Networks Inc.

Stray Voltage Record Form
Report of Customer Complaint

1. Zone Scheduling Team Responsibility – (Provide Location of Complaint)

Zone: 1	Operations Center: Clinton
Date Order Issued: August 07, 2008	
911 Address: 82328 Council Line	Meter #: H781858
Customer Name: Ross Brindley	Account #: 8157026678

2. Hydro One Field Staff Responsibility – Part 1

The FBC or MDET will ask the customer the following:

Question	Answer
Is the problem in your household or is it in other buildings (barn, garage)?	Mainly in the barns affecting the animals. Also in the house; headaches/bloody noses experienced
If the problem is in your household, when and where are you experiencing the problem?	In the mobile-section of the house. Ross goes through a new shaver each month. Shocks off sink & bathroom happen anytime during the day
If the problem exists in a building that houses livestock, what symptoms are the Livestock exhibiting?	Cattle have experienced abortions, behavioral changes, prolapse & mastitis. Lost 3 cows. The bull has burns on his hoofs, eating hay only. New born calves shake, lay down, found dead the next day. 8 calves lost in 2007
What time of day does the problem occur?	Time fluctuates throughout the day
Does the problem coincide with the operation of one piece of equipment?	No
If any voltage measurements have been taken by you or your electrical contractor, what were the measurements?	Yes, readings taken
Have you had any changes to your electrical system lately?	New light placed on barn is the only change

Further Location Information

DS or TS Name: Dunlop DS	Feeder: F1
Upstream Switch: SW310	Transformer Number and Size: 477

Provide the Post Trouble work order number that this investigation is being charged to.

Work Order Number:

Stray Voltage: Ross Brindley

Overview

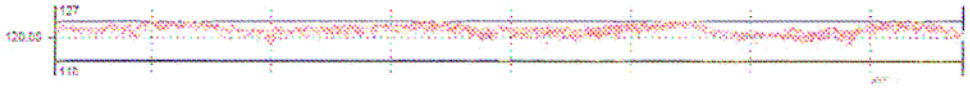
Customer Name	Ross Brindley
Customer Account	8157026678
Customer Address	82328 Council Line, ON - Clinton
Distribution Station and Feeder	Dunlop DS F1
Upstream Switch	SW310
MDET	R.Trudell, R. Groot, M. Murphy
Date of Tests and Recordings	Aug 14, 2008 – Aug 18, 2008

Service Pole

Monitoring Equipment	Candura
Model	PowerPro

- **Secondary Voltage (Channel 1 – Red)**

The Maximum and Minimum Secondary 120V voltages are supplied within Hydro One's Normal Operating Conditions.

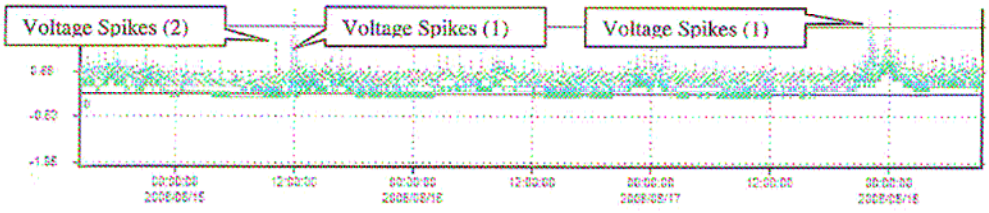


- **Primary and Secondary Neutral to Earth Voltage (Primary – Channel 2: Blue, Secondary – Channel 3: Green)**

The Maximum Primary and Secondary NEV are well below Hydro One's standard of 10Vrms which applies to the average rms voltage.

The voltage spikes (1) – indicated below – on the Maximum Primary NEV curve do not coincide with a voltage rise on the Maximum Secondary NEV or current rise, and could be attributed to neighboring customer activity, as the Primary 120V voltage usually dips during these events. It is however possible that these spikes could be attributed to the wind farm circuits.

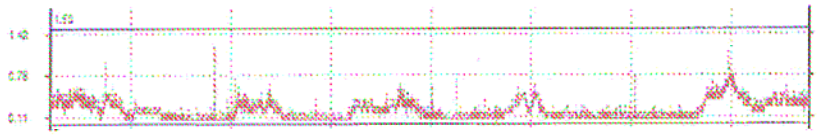
The voltage spikes (2) – indicated below – on the Secondary NEV do not coincide with an equally significant change in voltage or current on one of the other monitored channels and may be due to load in another farm service panel.



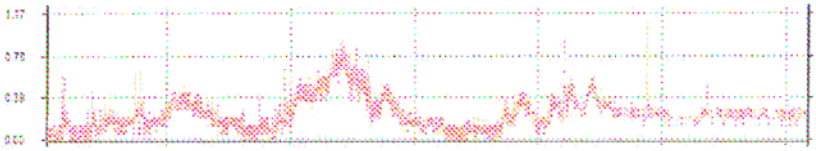
- **Neutral to Ground Rod – (Channel 4 – Dark Red)**

Channel 4 was connected across a 500Ω resistor between the service panel neutral and a customer ground rod located outside the barn. This reading was taken to compare it to previous readings taken, although direct comparison cannot be made as no 500Ω resistor was previously used.

As anticipated this data is lower than the Secondary NEV shown above.



Previous readings of the neutral to ground rod located outside the barn, taken from 24 – 27 June 2008, showed similar voltage levels:

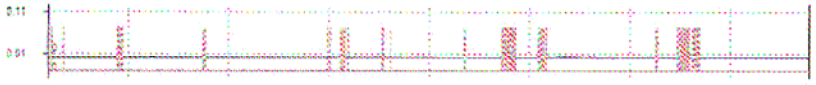


- **Contact Voltage (Channel 1 - Red)**

Monitoring Equipment	Candura
Model	PowerPro

A cow contact voltage was taken at the back of the barn – from the gate to the ground using a 500Ω resistor. A 5:1 PT was used to step up the recorded value.

The largest detected AC voltage was: (0.1V/5) = 0.02V.



Comparison of NEV to Generator Current

Two 27.6KV collector feeders (Goderich TS M5 and M6) for a neighboring wind farm are built on the same pole line as the 4.8KV distribution feeder that supplies the Brindley Farm. As identified in previous studies by Hydro One, the 4.8KV neutral's NEV has a similar profile as the current on the wind farm's collector feeders. This has been demonstrated below for one of the collector feeders.

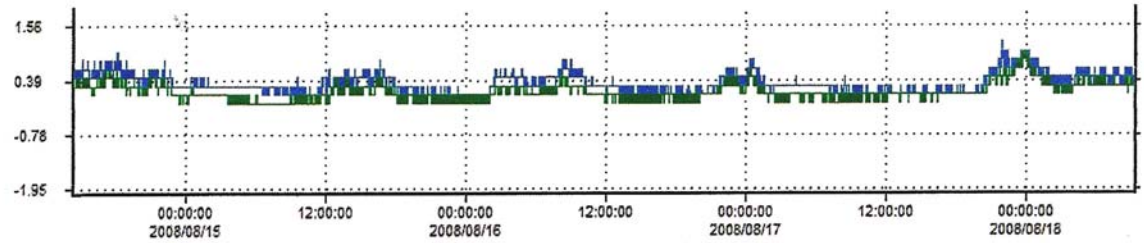


Figure 1 AVG Primary NEV and Secondary NEV

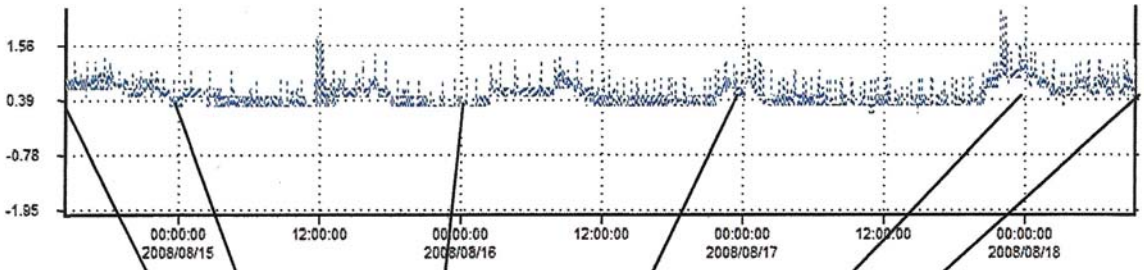


Figure 2 Maximum Primary NEV

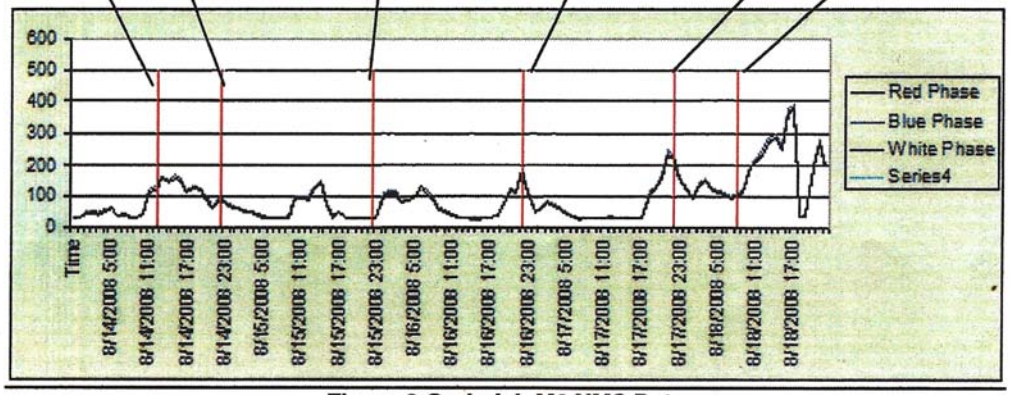


Figure 3 Goderich M6 NMS Data

Conclusion

- The supply voltage is within the normal operating range.
- Both the Primary and Secondary NEV are well below the Hydro One Primary NEV limit of 10Vrms.
- Cow contacted voltages are well below recommended OMFRA limits.
- The wind farm appears to contribute to the base NEV however a direct relationship between it and the instantaneous NEV voltage spikes cannot be verified. None the less these spikes do not exceed ~2V during the recording period.
- Seasonal changes to the NEV should be expected, however they should not result in the NEV exceeding the 10Vrms limit.

Recommendations

- Hydro One should offer to install a Dairyland VTNI filter at the customer's expense.
- Hydro One field staff should verify that none of the wind farm underground cables, step-up transformers or other equipment are attached to the Hydro One distribution neutral.
- [redacted] should be requested to verify that their wind farm equipment (generators and DVar) are operating within the required Hydro One technical requirements pertaining to harmonics, inrush etc.

OUR COMMENTS AS TO THE WAY THE ABOVE REPORT WAS WRITTEN

- **Hydro One distribution standards require that the NEV not exceed 10V what is it now?**
- **On page 4 (middle graph)** -the only problem with this graph, we where told on the phone on July 17/08 that the readings off the "condura testing equipment" showed 0.2 volts, with or without the wind turbines running**,** but there was a 3 second spike to **9 volts** on Thursday June 26/08 and Hydro One would not release these readings to us. Yet they used "part" of the test results on this report *(there is no 9 VOLTS showing)* **double standards to the farmer.**
- **Under the comparison** of NEV to Generator Current --It is **difficult to see what the actual voltage** is because the dots/lines up you can't see an actual voltage amount and trying to compare the wind farm current from 1-27.6kv line instead of 2 line amounts for the proper comparison
- Under the conclusion what we read as to the outcome of this report … **you are on your own because they got their reading when the power was LOW so therefore both the Primary and Secondary NEV are well below the Hydro One Primary NEV limit of 10Vrms limit**
- The wind farm appears to contribute to the base NEV however a direct relationship between it and the instantaneous NEV voltage spikes cannot be verified. **None the less these spikes do not exceed ~2V during the recording period.**

Hydro One Recommendations:

-Install a Dairyland filter at the customer's expense

- **Why** should the farmer pay to put it on a wind farm pole (As these **are NOT utility poles** which the township bylaw requires) but with all the regulations? **The stray voltage is not coming OFF the farm** it is being **dumped ONTO the farm.**

-Staff should verify that none of the wind farm cables, etc are attached to Hydro One distribution neutral.

- This should have been done at the beginning of testing, not when they are "handing the problem back to the farmer"

-Wind Farm should be requested to verify that their wind farm equipment are operating within the required Hydro One technical requirements pertaining to harmonics, inrush, etc.

- This is something that the farmer has **NO CONTROL** over and how do you get the wind farm to do this?

GENERAL Comments per this Hydro One report:

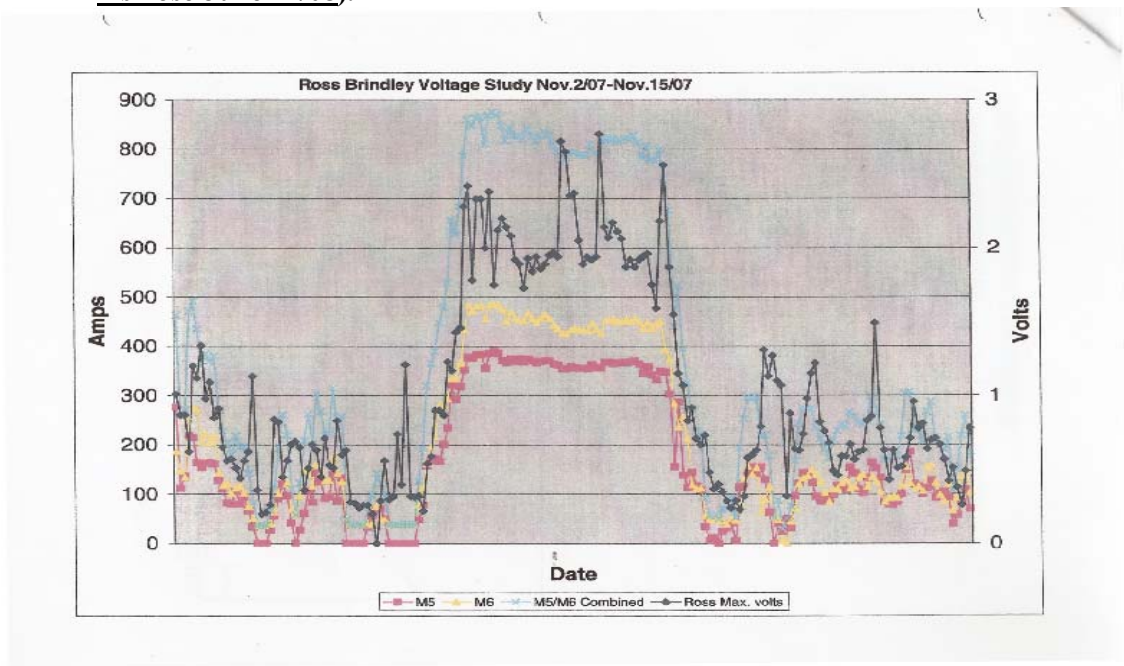
1. This investigation was not done when the power was high, fluctuating and damp out therefore you do not have a true and accurate recording of the whole stray voltage situation. (THE RIGHT CONDITIONS ARE VERY IMPORTANT)

2. The NEV at the farm was below the 10Volt level, which appears to mean the utility/wind company, can walk away because their target was met **and NO regulating authority pushes for the total correction of this terrible injustice put onto this farm.**

3. How do you get a utility and wind companies to correct the problem without having a governing/regulatory authority to figure out who and where the problem is and HOW it is to be corrected.

Attachment 2: this graph, also done by Hydro One (Nov2-15/07) you can clearly see what is going on. The M5 (red) + M6 (yellow) = Induction (light blue) The recording in Ross' barn is in dark blue. The investigator can give a written explanation. The graphs given in the first attachment are NOT clearly showing what is going on.

- **Please note that nothing has changed between the first and second attachments, on the farm, EXCEPT that the wind farm generator current was higher in the second attachment (Nov 2007) (stronger winds)**
- **In fact, we where still having animal health problems (the Bull was bleeding from his nose June 11/08).**



Thank you for allowing us to participate with written comments on of the proposed amendments to the distribution system code.

Ross and Darlene Brindley