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Williston & Associates Inc.
3324 Gregoire Rd. RR2
Russell, ON
K4R 1E5
Tel: (613)-445-0937
E-mail: dale.williston@sympatico.ca

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

Dear Ms. Walli:

Re: BOARD FILE NUMBER: EB-2007-0709, COMMENTS ON FARM STRAY VOLTAGE DISTRIBUTOR INVESTIGATION PROCEDURE

My comments are provided below for each section of the procedure.

Section H.4.2-Load Box
The most common source of a stray voltage customer complaint is a dairy farm. The farms of today have large loads, in the order of 50 KW. If the load box is to be used, then it needs to be larger to simulate actual farm loads. Alternatively, the values obtained during the test with a smaller load could be extrapolated to the 50 KW value because it is a linear network.

The load box shown on the sketch would require a disconnect switch with fuses for safety reasons.

Another option is to use the farm 240 V load. This is simpler and safer from a worker safety perspective. Again, if the load used for the test was 15 kVA, the Neutral-to-Earth Voltage (NEV) or Animal Contact Voltage (ACV) measured can be extrapolated to the level the 50 kVA level. The power factor of the load has no bearing on the NEV or ACV that would be generated. The level of load current would be the same and it is the current that the load draws that generates the ACV.

Section H.5.1.1 Animal Contact Test
The ability to repeat a measurement on a farm that was made in the past, or compare a reading from Farm A to Farm B, is critical for one to draw accurate conclusions. Because of all the variables that can have an impact on contact resistance, it will be very difficult to obtain the same contact resistance for two different ACV measurements making comparison of the two measurements invalid. Therefore, NEV measurements, which are much less dependent on contact resistance, should be used wherever possible to draw conclusions.

When measuring the ACV, the NEV should be measured simultaneously. Because NEV is constantly changing due to off-farm loads which can not be controlled during the test, the ratio of ACV to NEV is the key piece of data. That value will not change as the NEV goes up and down. The contact point with the highest ratio should then become the contact point used thereafter for testing and computation of the ACV. It is not practical in a dairy barn, or any livestock facility, to install a test lead for the purpose of performing ACV measurements using a recorder. The

livestock may disturb the lead, disconnecting it and thereby making the results invalid. The lead may become a safety hazard when animal becomes entangled or it may become a tripping hazard to humans in the livestock area. It is also not necessary. The ACV can be calculated by measuring the NEV with a recorder and using the ACV/NEV ratio to calculate the ACV.

Section H.5.2.2 Distributor Contribution Calculations, Item (3)
The formula is very complex and questionable. The distributor's contribution to the ACV is due to a portion of the 'off-farm' neutral current, plus a portion the 'on-farm' load neutral current, flowing through the farm grounding system. This generates neutral-to-earth voltage. The ACV is a percentage of the neutral-to-earth voltage. The livestock operator is concerned about the worst case ACV situation. Therefore, I would recommend the following approach: To simulate the worst case condition, a standard 240 V load level would be applied, such as 50 kW or 50 kVA. The ACV would be measured with the load on. The distributor would be responsible to deliver this level of load to the farm without exceeding the maximum acceptable level of ACV. Note that this would be V_{CCfull} as described in the procedure. It would be up to the distributor to take whatever measures it determines are necessary to achieve and maintain the ACV level below the acceptable limit. .

Section H.5.2.2 Distributor Contribution Calculations, Item (4)
Any three phase farm will also have some single phase loads. Therefore, the assumption that the distributor's contribution is V_{CCoff} would be invalid.

General Comments
The requirement to perform tests at peak hours will increase utility costs significantly and make scheduling tests more difficult. In areas with high concentrations of dairy farms, peak load may occur at 5:00 AM.

This procedure puts all the responsibility and cost on the utility. There is no indication that the customer is required to make any level of effort to determine whether or not the problem is originating on the farm.

The line load loading on all lines, and the load balancing on three phase lines, are constantly changing with the time of day, the season and the addition and removal of customers. If for example, a test was performed today and the maximum level of ACV was measured to be 95% of the acceptable limit, then there is a high probability that the maximum level will be exceeded sometime in the near future. It follows that any responsible livestock operator should be having a solution installed as an insurance measure. This was recommended by Ontario Hydro in the 19080s and several thousand farms installed mitigation devices. A program to extend this to all farms that do not have protection today would not only be prudent, in my opinion, it would be lees costly. The total man-hours to perform the tests outlined in this procedure will be in excess of 25 man-hours. At a cost of $100 per hour to cover all overheads, training, vehicles, test equipment etc, this is $2500 per test. If a program was set up where highly trained staff focused on installing mitigation devices and verifying their functionality, the cost would be less and the customer would be better served.

Thank you.

Best regards,

Original signed by

Dale Williston
President