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**NOTICE OF PROPOSAL TO AMEND A CODE**

**PROPOSED AMENDMENTS TO THE DISTRIBUTION SYSTEM CODE**

**BOARD FILE NUMBER: EB-2007-0709**

To: All Licensed Electricity Distributors  
All Participants in Consultation Process EB-2007-0709  
All Other Interested Parties

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The Ontario Energy Board (the "Board") is giving notice under section 70.2 of the *Ontario Energy Board Act, 1998* (the "Act") of its proposal to amend the Distribution System Code (the "Code").

**The Board's Farm Stray Voltage Consultation**

As announced by the Minister of Energy on June 22, 2007, the Board has received a Directive that requires the Board to implement such measures as the Board considers necessary to address the issue of stray voltage as it affects the farm sector. Specifically, the Directive states as follows:

The Board shall implement such measures which, in its own discretion, having regard to the objective related to quality of electricity service provided for in paragraph 1(1)1 of the Act, are necessary to ensure electricity service to farm customers, in relation to "tingle" or "stray" voltage, is of a quality that does not unduly impact the operation of the farm.

To address the Directive, the Board initiated a consultation process. The purpose of this process was to solicit input from interested parties regarding stray voltage, its potential impact on the farm sector and the identification of measures that could be implemented by the Board in response to the Directive. The consultation included the preparation of a Board staff Discussion Paper (the "DP") entitled *Farm Stray Voltage: Issues and Regulatory Options*, which took

into account information and views collected by staff from members of the Farm Stray Voltage Consultative Group<sup>1</sup> and through six meetings attended by farmers across Ontario. In addition, the Discussion Paper presented summary information drawn from three reports prepared by consultants engaged by Board staff.<sup>2</sup> The Discussion Paper and the three consultants' reports were posted on the Board's website on May 30, 2008. Stakeholders were invited to send written comments on the Discussion Paper, to which 18 interested parties responded as listed below. All written comments were also posted on the Board's website ([www.oeb.gov.on.ca](http://www.oeb.gov.on.ca)).

### Written Comments Received

#### On behalf of:

1. Brindley, Ross and Darlene
2. Dairy Farmers of Ontario
3. Electricity Distributors Association
4. Electrical Safety Authority
5. Federation of Ontario Cottagers' Associations
6. Fraser Consulting and Associates
7. Havas, Magda
8. Hillman, Donald
9. Hydro One Networks Inc.
10. Hydro Québec
11. Innes, Allan
12. Lantz Control Systems
13. MacKay, Gordon M.
14. New Brunswick Power
15. Socha, Judy
16. Waterloo North Hydro Inc.
17. Williston & Associates Inc.
18. Wireless Electrical and Electromagnetic Pollution

#### Cited as:

Brindley  
DFO  
EDA  
ESA  
FOCA  
Fraser  
Havas  
Hillman  
Hydro One  
Hydro Québec  
Innes  
Lantz  
MacKay  
NB Power  
Socha  
WNHI  
Williston  
WEPP

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<sup>1</sup> The Consultative Group was constituted by Board staff to provide information and insight based on experience with farm stray voltage; and to ensure stakeholder constituencies were kept informed as to the progress of the consultation. The members of the Consultative Group were: Ontario Federation of Agriculture; Electrical Safety Authority; Ontario Ministry of Agriculture, Food and Rural Affairs; Electricity Distributors Association; Hydro One Networks Inc.; Waterloo North Hydro Inc.; Ontario Ministry of Energy.

<sup>2</sup> BDR NorthAmerica Inc.; *Regulatory Approaches to Addressing the Impact of Stray Voltage on Farm Operations* (BDR 2008); Kinectrics Inc.; *Stray Voltage Mitigation* (Kinectrics 2008); and D.J. Reinemann, Ph.D.; *Literature Review and Synthesis of Research Findings on the Impact of Stray Voltage on Farm Operations* (Reinemann 2008). These reports are posted on the Board's Farm Stray Voltage [web page](#).

## **The Purpose of Amending the Distribution System Code**

The Minister's Directive refers to "the objective related to quality of electricity service provided for under paragraph 1(1)1 of the Act." The Code sets out, among other things, the obligations of distributors in relation to the 'quality of supply' including the obligation to "follow good utility practice in managing the power quality of the distributor's distribution system."<sup>3</sup> The Code also provides that distributors "shall respond to and take reasonable steps to investigate all consumer power quality complaints and report to the consumer on the results of the investigation."<sup>4</sup> These and other Code stipulations represent the minimum conditions that an electricity distributor must meet in carrying out its obligations to customers under its licence, the *Ontario Energy Board Act, 1998* and the *Electricity Act, 1998*.

The purpose of the proposed Code amendments (the "Amendments") is to establish standards and procedures designed to meet the objective set out in the Directive of ensuring that "electricity service to farm customers, in relation to 'tingle' or 'stray' voltage, is of a quality that does not unduly impact the operation of the farm".

## **Brief Background on Farm Stray Voltage**

The terms 'tingle' voltage and 'stray' voltage, mentioned in the Directive, refer to the difference in voltage potential (generally agreed to be 10 volts or less) between two points that a farm animal could make contact with at the same time. It can originate from a number of sources both on and off the farm.

One of the main contributing sources of stray voltage on farms is elevated current on the distribution neutral conductor. This current can be transmitted to animal contact locations on the farm through the earth by way of groundings on both the distribution and farm electrical systems, and by way of a common bond - required under Ontario's Electrical Safety Code - between the distribution system and farm system neutral conductors.

Farm stray voltage can have negative effects on livestock that come in contact with it. Most notably, a behavioural "avoidance" response has been identified. For example, where stray voltage is present cows entering or leaving an automated milking machine stall may experience a minor shock. This may cause animals to avoid the milking area, which in turn can have negative consequences for herd health and milk production.

While the electricity distribution system is the primary potential off-farm source of stray voltage, voltage potentials at a given animal contact location are frequently the combined result of both off-farm and on-farm sources. A solution to a given

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<sup>3</sup> The Code; s. 4.1.1.

<sup>4</sup> The Code; s. 4.1.3.

case where stray voltage is affecting farm operations may therefore involve both the electricity distributor and the farm customer, working with an electrical contractor or other qualified service provider.

Distribution utilities can reduce their contributions to farm stray voltage by lowering the amount of electric current flowing onto the farm either through the earth or by way of the primary/secondary neutral connection point(s). The choice of remediation method can depend on the characteristics of the situation and amount of reduction required. For example, increasing the number of groundings or balancing the loads on three phase lines involve modifications to the distributor's system at and/or near the farm. These are relatively low cost measures. If remediation involves modifications to the entire circuit, such as increasing the distribution voltage, costs can be significant depending on the length of the circuit and/or the number of customers connected to it. The most cost-effective solution can vary from one case to another.

At present, Ontario distributors are not subject to regulation with regard to farm stray voltage. Rather, distributors operate according to standards and procedures that they have developed independently. In the U.S., a number of regulatory bodies have taken steps to direct distributor actions when responding to farm customer requests for assistance with stray voltage situations. Regulators in Wisconsin, as well as Idaho and more recently Michigan determined that if the current measured between animal contact points exceeds 2 mA, distributors must take steps to ensure their system contributes no more than 1 mA. Other regulators have chosen different measures, and not all jurisdictions have adopted a compulsory approach.

### **Proposed Code Amendments and Related Stakeholder Comments**

In considering the nature and scope of measures that could be implemented in response to the Minister's Directive, the Board has been assisted by the DP and by the input of stakeholders, including all of the written comments provided by stakeholders on the DP. The following is a summary of the proposed Amendments, as well as a summary of selected stakeholder comments that illustrate the general nature and, where applicable, the range of stakeholder views on the issues addressed. The proposed Amendments are attached to this Notice as Appendix A.

#### **1. ACC/ACV ('Farm Stray Voltage') and Livestock Farm Operations**

At the request of Board staff, consultants prepared a literature review of experimental and field studies on the subject of the impact of stray voltage on farm operations and a survey of regulatory approaches to addressing farm stray voltage in other jurisdictions.<sup>5</sup> Having reviewed the information provided in these

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<sup>5</sup> Reinemann 2008 and BDR 2008 respectively.

reports, the Board accepts that farm stray voltage, where this is defined as animal contact current (ACC) in excess of 2 mA; or equivalent animal contact voltage (ACV) in excess of 1 V can potentially have an undue impact on livestock farm operations.<sup>6</sup>

The Board notes that in written comments on the DP, some participants took issue with one or more aspects of this approach. Some felt that the definition of farm stray voltage (i.e. ACC/ACV) and/or the scope of the consultation should have included other electrical characteristics or phenomena that in their view affect animals in a similar manner.<sup>7</sup> Others expressed the view that a lower ACC/ACV threshold should be recognized.<sup>8</sup> It was also suggested that while this ACC/ACV level is suitable for large animals, a second threshold should be adopted for smaller and therefore less sensitive species.<sup>9</sup> A related suggestion was that since the research on which the threshold is based was conducted “in other jurisdictions” it “should be validated in Ontario” before being used for regulatory purposes.<sup>10</sup>

The Board considers it appropriate to identify an ACC/ACV threshold below which a distributor is not required to take any remedial action, but also recognizes that the threshold proposed for present purposes - ACC/ACV of 2 mA or 1 V equivalent - may in the future be revisited if warranted in view of emerging information on a host of dynamic variables including: the nature and number of farm stray voltage cases in Ontario; future findings of ongoing scientific studies; operating characteristics of rural distribution systems; technological innovations on both the farm customer side and the distributor side; and evolving safety related regulations.

Given the potential impact of farm stray voltage on farm operations, the Board believes that, where there are indications in the form of altered livestock behaviour or performance that farm operations may be affected by excessive ACC/ACV<sup>11</sup>, livestock farm customers should be able to request that distributors investigate and where applicable rectify ACC/ACV resulting from the design, condition and/or operation of the distribution system.

Since a quality of supply problem in relation to ‘tingle’ or ‘stray’ voltage only exists if farm operations are being affected by ACC/ACV, the Board also believes that distributors should be permitted to ask - as part and parcel of their customer response process - that livestock farm customers provide such minimum amount of information about their farm, its operations and in particular the livestock

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<sup>6</sup> Detailed definitions are provided in Appendix A; p. 1.

<sup>7</sup> Fraser; pp. 2, 4; Havas; pp. 1, 2, 4; Hillman; pp. 1, 3; WEEP; pp. 2 – 3.

<sup>8</sup> Fraser; pp. 2, 7; Havas; Attachment, s. 30; s. 37; Hillman; pp. 4, 7; Lantz; p. 1; and Socha; p. 3.

<sup>9</sup> The OFA suggested that two thresholds be used: 2 mA for livestock species where adults weigh 150 kg or more; and 5 mA for livestock species where adults weigh less than 150 kg. OFA; p. 3.

<sup>10</sup> EDA; p. 3.

<sup>11</sup> In the OFA’s view, this is where animals are “demonstrating behaviour or performance consistent with the presence of stray voltage.” OFA; p. 3.

behaviour and/or performance symptoms of concern as to allow the distributor to assess the scope of the potential quality of supply problem.

The Board proposes that the Code be amended to require a distributor to initiate a farm stray voltage investigation, using the procedure also to be specified in the Code, when a livestock farm customer provides the distributor with information that reasonably indicates that farm stray voltage may be adversely affecting the operation of the livestock farm customer's farm.

## 2. ACC/ACV as a 'Quality of Supply' Indicator

As indicated in the DP, identifying the source or sources of ACC/ACV can involve testing on the farmer's premises, and can be both detailed and technical.<sup>12</sup> One of the factors affecting the complexity of such investigations is the nature of the indicator used as a trigger for distributor action. The DP offered two options for this indicator: a) primary (i.e. distribution system) neutral to earth voltage (PNEV); or b) the contribution of the distribution system to ACC/ACV.<sup>13</sup>

Regarding these two options, Hydro Québec and WNHI indicated a preference for PNEV in light of the fact that testing is relatively simple and comparatively low cost. Other comments pointed out the main weakness of the PNEV approach, namely the inconsistent relationship between PNEV and ACC/ACV.<sup>14</sup> Potentially, as indicated by some participants, reducing PNEV in an effort to lower ACC/ACV could involve significant cost;<sup>15</sup> and may or may not have the desired impact on ACC/ACV.<sup>16</sup>

A number of interested parties expressed the view that the distributor remediation target must directly involve ACC/ACV.<sup>17</sup> The Board finds persuasive the combination of arguments presented in support of this view, which include:

- Regardless of PNEV level, if there is no ACC/ACV, "there is no real stray voltage issue" (DFO; p. 3)
- Targeting ACC/ACV expands the range of cost effective solutions (EDA; p. 2)
- The ACC/ACV approach has proved practicable in other jurisdictions (ESA; p. 5)
- Targeting ACC/ACV removes an element of uncertainty given the inconsistent relationship between PNEV and ACC/ACV (NB Power; p. 2).

<sup>12</sup> DP; pp. 78 – 79.

<sup>13</sup> DP; p. 74.

<sup>14</sup> ESA; p. 5; NB Power; p. 2; OFA; p. 2.

<sup>15</sup> Hydro One; p. 3; Williston; p. 1.

<sup>16</sup> ESA; p. 5; Hydro One; p. 3; NB Power; p. 2.

<sup>17</sup> DFO; p. 3; EDA; p. 2; ESA; p. 5; NB Power; p. 2; OFA p. 3.

The Board also notes that several interested parties suggested alternative indicators that could be used to trigger distributor action, including:

- Both PNEV and ACC/ACV should be targeted (Fraser; p. 7)
- Overall ACC/ACV (since this is the concern of the farmer) not just the contribution from the distribution system (Hydro One; p. 4)
- Distributors should target both ACC/ACV and earth currents because even where tests show ACV is low, the earth current flowing to the barn ground can be very high due to very low resistance to earth (Lantz; p. 1)
- Since ACC/ACV varies from one contact location to the next, the voltage measured between the barn ground and remote earth will provide a single indicator for ACC/ACV throughout the barn (Williston; p. 4).

The Board recognizes that the main argument in favour of PNEV is its cost relative to other alternatives, including the distributor's contribution to ACC/ACV. However, the Board believes that the potential cost differential is substantially outweighed by the uncertainty inherent in using a PNEV-based approach. The Board also believes that, to be effective as a regulatory measure, the 'quality of supply' indicator must clearly show whether the distribution system is a source of ACC/ACV at any given animal contact location. Therefore, the Board has determined that the distributor's contribution to ACC/ACV be adopted as the indicator of the 'quality of supply' in relation to farm stray voltage.

### 3. A Proposed ACC/ACV Distributor Contribution Threshold

Having established that a distributor must manage its contributions to ACC/ACV at animal contact locations on livestock farms, it remains to identify a threshold value beyond which a distributor would be expected to take remedial action. The Board notes that three U.S. jurisdictions recognized 2 mA/1 V as the ACC/ACV value above which adverse impacts on farm operations may begin to occur, and further that all three adopted a distribution system contribution threshold of half this value, or 1 mA ACC/0.5 V ACV.<sup>18</sup> In written comments, a number of stakeholders endorsed these values.<sup>19</sup> Some, however, offered support only conditionally:

- The ACC/ACV threshold should be subject to review as more information on "non-steady state transients and harmonics" becomes available;<sup>20</sup>
- The threshold represents the maximum ACC/ACV from all sources,<sup>21</sup> and

<sup>18</sup> DP; p. 75.

<sup>19</sup> Brindley; p. 2; DFO; p. 3; ESA; p. 5; Fraser; p. 7.

<sup>20</sup> Fraser; p. 7.

<sup>21</sup> Havas; p. 4; Innes; p. 1; MacKay; p. 1.

- The threshold is supportable as long as Variable Threshold Neutral Isolators are not prohibited.<sup>22</sup>

Alternative views were also presented. For example, one participant argued that due to technical and economic uncertainties affecting the cost of compliance, any threshold value used elsewhere should first be “validated” before being adopted in Ontario.<sup>23</sup> The Board is aware that Board staff attempted to gain insight into the potential cost to distributors of implementing regulatory requirements in relation to farm stray voltage by including this subject in the scope of work to be covered in the cross-jurisdictional survey (see BDR 2008). The information presented in that report suggested that, including where jurisdictions adopted regulatory measures that include a 1 mA ACC/0.5 V ACV distribution system contribution threshold, rate impacts have been negligible.<sup>24</sup>

The Board is aware that the impact on rates of implementing the proposed Amendments is an important consideration. Information currently available suggests that province-wide, the number of cases may be relatively small. However, costs will vary by the number of farms actually affected by ACC/ACV within a given distributor’s service area. Estimating the potential rate impacts for any one distributor’s customers would require information not currently collected by distributors. This includes the number of livestock farm customers they serve and the number of farm stray voltage complaints and inquiries they currently respond to. Moreover, potential remediation costs can vary depending on a number of factors, including the characteristics and condition of the distribution circuit (see DP section 7).

A second alternative view presented by a participant was that since 2 mA/1 V is the ACC/ACV level “believed to start affecting animal behaviour”, this level should be the distributor’s target without regard to respective distributor versus farm contributions.<sup>25</sup> However, conditions that might cause ACC/ACV on the farm wiring system are unpredictable (e.g. fault currents due to mechanical wear and tear) and perhaps to some extent unavoidable (e.g. unbalanced on-farm loads).<sup>26</sup> Consequently, the Board believes that an allowance needs to be made to account for possible on-farm contributions to ACC/ACV.

A third alternative suggested – by the OFA – was that two ‘trigger values’ be adopted - one for large animals (2 mA/1 V as described above) and a higher one for smaller animals. In both cases, it was the OFA’s opinion that the threshold for distributor contributions to ACC/ACV should be half of the overall trigger value.<sup>27</sup>

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<sup>22</sup> NB Power; p. 3. See DP pp. 50 – 52.

<sup>23</sup> EDA; p. 3.

<sup>24</sup> BDR 2008; pp. 37; 41; 44; 49; 54.

<sup>25</sup> Hydro One; p. 5.

<sup>26</sup> Williston suggests that if on-farm sources are excluded, a number of simpler approaches could be considered such as a threshold based on barn to remote earth voltage. Williston; p. 4.

<sup>27</sup> OFA; p. 3.

The Board sees a number of advantages to the approach that distributors be required to take remedial steps at a threshold of 1 mA ACC/0.5 V ACV. The first advantage is that in the absence of ACC/ACV originating on the farm, adopting the threshold proposed will result in an overall ACC/ACV level equal to the distributor's contribution. Second, remedies targeting a 1 mA/0.5 V threshold are likely in practice to produce an even better (i.e. lower) result. Third, the ability of isolators such as VTNI's to eliminate the transfer of current between the primary and secondary neutral conductors under normal operating conditions may permit the achievement of this threshold in a significant proportion of cases. Finally, this threshold, as is the case with any numerical standard, can be revised in the light of more and better information obtained over time.

The Board is aware that although it is understood to be primarily a dairy farm issue, ACC/ACV can affect other types of livestock. Accordingly, the approach adopted for the purposes of the proposed Amendments presumes that any regulatory framework would be broadly applicable to all farms where livestock can be affected by ACC/ACV. However, as noted in the DP, not all regulators that adopted a 'cow based' distributor remediation action threshold opted to apply it to every type of livestock farm.<sup>28</sup>

Strictly speaking, the consensus view that 2 mA/1 V ACC/ACV is the benchmark beyond which concern for the potential impact on farm operations is accepted is derived from studies of cows and therefore applies to cows, or perhaps more broadly to cattle. As noted in the consultant's report however, other species have been shown to be sensitive to ACC/ACV in much the same way, but are generally considered less sensitive than cows and cattle.<sup>29</sup> It follows that a 'cow based' threshold could be acceptable as the basis for dealing with ACC/ACV problems regardless of the type of livestock in question.

The DP invited participants to comment on whether the same numerical standard should be applicable in all cases, regardless of species 'sensitivity'. Stakeholder responses presented various perspectives, including the view that using the same numerical threshold for all types of livestock operation would simplify the testing procedure and limit the potential for confusion.<sup>30</sup> It was also recommended that in "the absence of data" for other livestock species, "a single threshold limit" should be applicable to all farms.<sup>31</sup> However, this argument could be used to support restricting the application of the regulatory framework to dairy farms, or to applying the same threshold to all livestock farms. Similarly, the view that in practice "the majority of identified issues are with dairy farms"<sup>32</sup> could

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<sup>28</sup> See DP; p. 77. As noted in the DP, regulators have described the eligible types of farm in various ways. Only Michigan provides a formal definition of 'animal' as "vertebrates, including but not limited to dairy and beef cattle, sheep, swine, poultry and horses". See DP; pp. 58 - 59.

<sup>29</sup> Reinemann 2008; pp. 28 – 32; also see DP p. 42.

<sup>30</sup> Brindley; p. 2.

<sup>31</sup> EDA; p. 3.

<sup>32</sup> WNHI; p. 1.

support restricting the applicability of the threshold to dairy farms or generalizing it on the basis of the minimal practical consequences of doing so.

A number of interested parties expressed the view that the regulatory approach should recognize specific threshold values for individual livestock species<sup>33</sup>, some specifying that this should be supported by scientific research.<sup>34</sup> Hydro One commented that “[t]he critical need is only for dairy and cattle farms. Hydro One has received little to no complaints regarding other types of livestock.... It would not be economical to enforce the same voltage threshold for other livestock.”<sup>35</sup>

Finally, one written comment noted that the issue of the applicability of a threshold may be overshadowed by the fact that as a practical matter, neutral isolation (where applicable and appropriate) can reduce ACC/ACV to levels far below the thresholds proposed here, and at relatively low cost.<sup>36</sup>

The Board believes that the main principle applicable to this issue is consistency of treatment for all livestock farm customers. What this means in this instance is that when a farm customer recognizes symptoms in either livestock behaviour or performance – regardless of species – suggestive of a potential ACC/ACV problem, the concern should be addressed and resolved in substantively the same manner for all.

Given the wide variety of animal species that are potentially subjected to ACC/ACV, and the potential complications associated with two or more species cohabiting on the same farm property, it would be potentially both inequitable and impractical to apply a regulatory approach only to those farm customers that owned livestock for which a scientifically derived threshold ACC/ACV value has been set.

In order that distributors’ obligations in relation to the Code are clear, the distributor needs an identifiable ‘end state’ indicating the point beyond which no further action is required on its part to reduce ACC/ACV contributions from the distribution system. For example, the situation could be resolved without reference to a distributor ACC/ACV contribution threshold value if it was observed that the symptoms of concern to the farmer were no longer apparent; or that ACC/ACV was no longer detectable. Given that the distributor cannot be responsible for rectifying potential contributions to ACC/ACV from the farm system and the technical unavailability of ACC/ACV at some minute level, neither of these desired end-states can be guaranteed by the actions of the distributor alone.

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<sup>33</sup> Fraser; p. 7; OFA; p. 3.

<sup>34</sup> EDA; p. 3; ESA; p. 6; Hydro One; pp. 5 – 6; Williston; p 4;

<sup>35</sup> Hydro One; pp. 5 – 6.

<sup>36</sup> Williston; p. 4.

In consideration of the above, the Board proposes to amend the Code to require that where tests reveal that the distributor's distribution system is contributing to farm stray voltage on a farm, the distributor take steps to ensure that such contribution does not exceed 1 mA ACC or 0.5 V ACV.

#### 4. ACC/ACV Investigations

Not all jurisdictions that regulate distributors in relation to farm stray voltage have opted to require the use of a specific investigation procedure (as noted in the DP). For example, while Idaho embedded a standard procedure in its farm stray voltage 'Rules', Michigan distributors apparently may use either the procedure set out in regulations or one they developed themselves and submitted to the Michigan regulator for approval.<sup>37</sup>

Written comments were received on both sides of this issue. The argument in favour of a prescriptive approach cited most often involved the requirement for consistency: a common procedure assures consistent testing and consideration of every case, and provides uniform information for analysis and comparison purposes.<sup>38</sup>

It was further proffered that some distributors may find the necessity of developing an investigation procedure on their own "onerous", particularly if only a small number of livestock farm customers are served and/or ACC/ACV problems are rare in their service territory.<sup>39</sup> No comments by distributor-related stakeholders were made to this effect, but one distributor did specifically endorse the prescriptive approach.<sup>40</sup>

Juxtaposed to these views were comments indicating a preference for an approach based on establishing "goals and objectives" for the procedures, allowing distributors to develop their own specific methods. It was suggested that consistency can be assured if distributors file or post their individual procedures.<sup>41</sup> A recurring theme, however, involved the inherent variability of each case necessitating, it was argued, an allowance for flexibility in testing procedures.<sup>42</sup>

In the Board's view, posting or filing all distributors' investigation procedures may sooner or later result in a consistent and perhaps even uniform approach, but only if these are individually subject to regulatory approval would an acceptable methodology be ensured. Moreover, a procedure *as prescribed* can be designed

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<sup>37</sup> DP; p. 79

<sup>38</sup> Brindley; p. 3; ESA; pp. 6 – 7; DFO; p. 4; ESA; p. 6; Fraser; p. 7; WNHI; p. 1.

<sup>39</sup> ESA; pp. 6 – 7.

<sup>40</sup> WNHI; p. 1.

<sup>41</sup> Hydro One suggests that this is analogous "to the approach taken for Connection Procedures for transmitters." Hydro One; p. 6.

<sup>42</sup> NP Power; p. 4; OFA; p. 3.

to indicate steps or elements where discretion should be exercised or is otherwise permitted.

In consideration of the above, the Board will prescribe an investigation procedure that permits the accurate determination of the contribution from the distribution system to total measured ACC/ACV at animal contact locations. The investigation procedure, which will be included as Appendix H to the Code, will be released for notice and comment in due course. The Board believes, however, that it is efficient to solicit comments on the remainder of the proposed Amendments at this time notwithstanding that the investigation procedure is not yet available. In the Board's view, given the highly technical nature of the investigation procedure relative to the non-technical nature of the remainder of the proposed Amendments, further delay in releasing the proposed Amendments for comment pending the release of the investigation procedure is not warranted.

#### 5. Distributor Obligations to Ensure Investigators are Qualified

As noted in section 2 above, identifying the source or sources of ACC/ACV can involve a detailed, technical process. This view was underlined by written comments that raised concerns of a technical nature related to investigations.<sup>43</sup> It is clear to the Board that expertise is an important ingredient in the successful resolution of ACC/ACV problems where these arise. However, regulatory documentation from other jurisdictions mention training most often in the context of providing rural electricians with instruction in how to diagnose and deal with on-farm sources. Of the jurisdictions that regulate farm stray voltage, only Idaho defines the qualifications persons must have to conduct stray voltage investigations on behalf of distributors.<sup>44</sup>

As mentioned in the DP, when 'tingle voltage' first came to the attention of Ontario electricity professionals some 30 years ago, the role of the distribution system was not well understood.<sup>45</sup> Due in part to the relative infrequency of ACC/ACV cases in Ontario over the last 10 to 15 years, familiarity with the issue as well as diagnostic and remediation expertise may not be widely available to farmers and distributors alike.<sup>46</sup>

Accordingly, the need for some level of training was recognized in the DP.<sup>47</sup> This view was reinforced by the broad consensus among those who submitted written comments. The proper testing, diagnosis and selection of an approach to remediation require expertise on the part of whoever is investigating the problem

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<sup>43</sup> Havas; p. 3 and Williston; p. 3 mention issues related to measurement techniques.

<sup>44</sup> See the DP; p. 84.

<sup>45</sup> DP; p. 25.

<sup>46</sup> DP; p. 31. Improper training can result "in the customer spending tens of thousands of dollars with no resolution of the problem." Williston; p. 5.

<sup>47</sup> DP; pp. 82 - 83.

and analyzing the test data for remediation purposes, regardless of whether the focus is distribution system or on-farm sources of ACC/ACV.<sup>48</sup> On the premise that training is desirable, the DP posed two options: training should be recommended or alternatively, required.

Three written comments suggested the former view. One focussed on the fact that where distributor personnel deployed to address a complaint are professionally qualified engineers, “extensive” specialized training should not be needed.<sup>49</sup> Another pointed out that non-compulsory training would provide distributors with a greater degree of “flexibility”, and potentially minimize the impact on rates of meeting a compulsory training requirement.<sup>50</sup> A third comment was that “training with a suitable curriculum should be recommended”.<sup>51</sup>

A variety of written comments expressed sentiments that explicitly or by implication supported some form of training requirement.<sup>52</sup> Some added that training programs should cover a range of related topics, including prevention, on-farm safety code requirements, etc.<sup>53</sup> While one comment indicated that training is required only for personnel responsible for supervising investigations and interpreting the results,<sup>54</sup> others did not distinguish between those using test equipment and those interpreting test results.<sup>55</sup>

The Board acknowledges the view that provided the investigation procedure is sufficiently well defined, otherwise professionally qualified personnel would be capable of undertaking most testing activities needed on the distributor’s side of the demarcation point.<sup>56</sup> However, by all accounts it is important that investigation and remediation activities carried out by or on behalf of the distributor be informed by a thorough understanding of on-farm conditions that can affect ACC/ACV. This requires on the part of personnel responsible for the distributor’s response at least a familiarity with: farm electrical wiring and electricity uses and usage patterns; the various ways in which the distribution system and farm wiring system are interconnected and safety code standards related thereto; and the specific facilities and conditions in animal contact locations that when considered all together, can give rise to ACC/ACV.

The Board’s view is that professionally qualified persons (whether distributor employees or contractors) should be responsible for ACC/ACV related investigations involving distributor-owned facilities, including any activities related

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<sup>48</sup> Brindley; pp. 1, 3; DFO; p. 5; ESA; p. 7; OFA; p. 4.

<sup>49</sup> Brindley; p. 3.

<sup>50</sup> WNHI; p. p. 2.

<sup>51</sup> OFA; p. 4.

<sup>52</sup> Fraser; p. 7; WEEP; p. 4. See also citation in the three footnotes that follow.

<sup>53</sup> DFO; p. 5.

<sup>54</sup> ESA; p. 7.

<sup>55</sup> Hydro One; p. 7 and NB Power; p. 4.

<sup>56</sup> As argued by the EDA; p. 5.

to remediation of distribution system contributions to ACC/ACV. The Board also proposes to amend the Code to ensure that these individuals, preferably as demonstrated by documentation attesting to either relevant training or equivalent experience in lieu of training, are familiar with the investigation and remediation of distributor contributions to ACC/ACV.<sup>57</sup>

## 6. Distributor Responses to Farm Stray Voltage Requests

If ACC/ACV is present on a farm in excess of the threshold level proposed here (i.e. 2 mA/1 V), the Board accepts that the efficiency of the distributor's response to a farm customer's request for assistance can have an impact on the severity of consequences for the farm's operations. Equally, the manner in which the information is collected and shared between the distributor and the customer can influence the conduct of both investigation and remediation processes, and of any dispute resolution proceedings that may arise.

The DP noted that authorities in two of the states surveyed for the purposes of the consultation require merely that distributors develop and file a procedure for responding to farm customer requests. A third state is more prescriptive, having established formal procedures governing how farm customers may submit such requests, and how distributors must proceed through specific processes within fixed time limits.<sup>58</sup>

In view of the fact that distributors are already required to document and make available to customers their customer complaint and dispute resolution processes, the first issue the DP raised for stakeholder comment was whether a specific 'farm stray voltage' customer response procedure (CRP) is needed at all.

One participant articulated a position against the need for a specialized CRP, arguing that existing CRPs were sufficient and that the use of a specialized procedure "will cause inefficiencies in LDC/customer interactions and could result in increased average customer response times."<sup>59</sup>

The balance of the written comments received on this issue took positions in favour of either the establishment of an obligation that distributors have a special farm stray voltage CRP; or more prescriptively, that the Board specify the content of a CRP to be followed. Among those who took the latter view, the rationales offered included:

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<sup>57</sup> The Board notes that this approach is analogous to that described in the Code in relation to persons involved in providing metering services (the Code; section 5.3.9).

<sup>58</sup> DP; p. 88.

<sup>59</sup> EDA; pp. 5 – 6.

- Distributors should not have discretion over whether, what and when information should be disclosed to farm customers following testing;<sup>60</sup>
- CRPs should include target timelines for key activities;<sup>61</sup> and
- A prescribed CRP would mean consistent responses from all distributors for all livestock farm customers.<sup>62</sup>

On the other hand, a common theme among those who favoured a more flexible approach was practicality:

- “In the end, all the farmer wants to have is an easy and quick way to report a stray voltage issue. ...After the initial call, a follow-up call or visit from the distributor within a reasonable amount of time would be required.”<sup>63</sup>
- Mandating requirements is really only practicable once information becomes available following the introduction of new regulatory measures, such as the number of farm customers responding relative to the resources available to the distributor to meet the demand; and the factors and conditions that affect the time a distributor takes to carry out each step included in the regulatory approach. <sup>64</sup> “Timelines should be tracked before they are entrenched in any regulatory requirements.”<sup>65</sup>
- “Prescribing a response procedure is unlikely to help meet the wide variety of circumstances that will arise over time or help [distributors that] have less contact with farm customers become better used to working with those customers.”<sup>66</sup>
- “It is unlikely the Board could develop a detailed procedure suitable to all utilities given the differences in organisation structure within utilities and the lack of intimate knowledge about the inner working of these organizations.”<sup>67</sup>

In consideration of the above, and acknowledging that some existing distributor's customer response processes may already be suitable for farm stray voltage purposes, the Board proposes to amend the Code to provide that distributors serving livestock farm customers document, post on their web site and otherwise make available upon request, and file with the Board upon request a farm stray voltage customer response procedure. The procedure must describe the steps the distributor will take to respond to farm stray voltage complaints and inquiries, including: information on how and to whom farm stray voltage complaints and inquiries should be made by livestock farm customers; the types of information the distributor expects from livestock farm customers regarding the reason for

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<sup>60</sup> ESA; p. 13.

<sup>61</sup> Fraser; p. 9.

<sup>62</sup> WNHI; p. 2.

<sup>63</sup> DFO; p. 7.

<sup>64</sup> Hydro One; p. 8.

<sup>65</sup> Ibid; p. 2.

<sup>66</sup> OFA; p. 4.

<sup>67</sup> Williston; p. 4.

their concern that ACC/ACV from the distributor's system is affecting farm operations; and the estimated amount of time the distributor requires following receipt of a complaint or inquiry to contact the livestock farm customer for the purpose of scheduling a site visit to initiate an investigation, where an investigation is required. Distributors are reminded that matters such as the scheduling of appointments and written responses to inquiries are the subject of service quality requirements that will take effect on January 1, 2009. These are contained in section 7 of the Code, and a distributor's customer response procedure must be consistent with all applicable service quality requirements.

## 7. Distributor Reporting Requirements

Distributors are currently required to file various types of information on a periodic basis for a number of purposes including rate-making and service quality performance assessment. The Board also requires that distributors maintain records of *written* complaints and remedial actions taken in response to them, but distributors are not generally required to maintain databases on investigations related to farm stray voltage.

Of the regulators surveyed that have established farm stray voltage regulations, only Wisconsin prescribes a data tabulation and semi-annual reporting procedure related to distributor farm stray voltage investigations.<sup>68</sup> This data is combined with that collected by Public Service Commission of Wisconsin personnel in the course of their own investigations, allowing the periodic publication of detailed statistical reports tracking farm stray voltage incidence, levels, contributions by source, etc.

Two options were presented in the DP, both of which were based on the premise that distributors should collect data related to livestock farm customer requests in relation to farm stray voltage. The difference between the two involved *the party obliged to analyze the information collected*. Under one option, the Board reviews information analysed and submitted by distributors in prescribed annual filings; in the other, information is collected by distributors and made available to the Board for review and analysis as and when requested.

The Board notes that most written comments on this issue expressed a preference for the second alternative whereby distributors must collect information as specified and make it available to the Board upon request. Noteworthy were comments to the effect that information to be collected should be clearly specified<sup>69</sup> in order to minimize costs for distributors and the Board.<sup>70</sup> The Board concurs with this view and would add that some degree of

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<sup>68</sup> See DP; pp. 62 – 63.

<sup>69</sup> Brindley; p. 4; Hydro One; p. 8. The OFA (p. 5) lists six items to be tracked.

<sup>70</sup> WNHI; p. 2.

consistency in terms of the types of information collected and maintained by distributors is desirable.

Accordingly, the Board proposes that the Code be amended to provide that distributors record, retain and provide to the Board, on request and in the form and manner required by the Board, information in relation to farm stray voltage complaints and investigations.

## 8. Providing Information to Livestock Farm Customers

The DP expressed the view that “the efficiency with which a stray voltage concern can be dealt with may depend on how well farmers are informed” on the effects of ACC/ACV on livestock and other farm conditions often associated with these same symptoms; on how on-farm ACC/ACV sources are investigated and resolved; references to resources for expert technical assistance and advice; how to initiate an investigation by their distributor; and the process used to resolve disputes with their distributor.<sup>71</sup>

Of the regulators surveyed by the consultants, only Connecticut requires distributors to provide farm customers with ACC/ACV information on a regular basis. In some other jurisdictions, it was noted, farm-related organizations have taken on this role.<sup>72</sup> In Ontario, some distributors currently provide information on “stray” or “tingle” voltage to farm customers at their discretion.

Two optional regulatory approaches were provided in the DP: distributors with livestock farm customers must either a) provide access to information on ACC/ACV and the distributor’s related procedures; or b) provide specific types of information in a prescribed form at established intervals.

Among the written comments received, only the DFO expressed a preference for a comprehensively prescriptive approach, but in the context of their added suggestion that the information be prepared by way of a multi-party effort (mirroring the Québec approach).<sup>73</sup> Apart from one comment to the effect that existing provisions in the Code obliging distributors to provide information to customers are sufficient,<sup>74</sup> all other written comments supported a less restrictive approach. Several arguments in favour of this choice were offered:

- Engaging the farm community will reduce the number of disputes and resolve issues faster;<sup>75</sup>

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<sup>71</sup> DP; p. 96.

<sup>72</sup> BDR 2008; p. 70. The Ontario Federation of Agriculture publishes a Fact Sheet entitled *Identifying Tingle Voltage*, which is available on their website.

<sup>73</sup> In which the DFO would participate; see DFO; p. 10.

<sup>74</sup> EDA; p. 7. The Code currently provides that in their Conditions of Service, distributors must include a description of their dispute resolution process; The Code; section 2.4.6 and Appendix A; section 1.8.

<sup>75</sup> ESA; p. 13.

- Distributors can and should decide how to execute this task in a cost-effective manner;<sup>76</sup> and
- The less restrictive the requirement the more distributors are spared “ongoing unnecessary work”.<sup>77</sup>

The Board appreciates the potential inherent in the approach suggested by the DFO, whereby key stakeholder groups cooperate in the production of a farm stray voltage information package that can then be disseminated by those same stakeholders to all livestock farmers.<sup>78</sup> Ideally, such an information package would include references to authorities responsible for and sources of specific types of related information, how to contact and/or access them, as well as information on distributors’ farm stray voltage customer response procedure and dispute resolution process.

The Board proposes that the Code be amended to require that, at least annually, distributors notify their livestock farm customers in writing as to how they can obtain from the distributor: information on farm stray voltage; a copy of the distributor’s farm stray voltage customer response procedure (see section 6 above); and a copy the distributor’s dispute resolution process as set out in its Conditions of Service.

## 9. Other Issues

Three additional issues were raised in the DP that the Board wishes to comment upon: a) distributor discretion in resolving distribution system ACC/ACV contributions; b) responsibility for investigating on-farm ACC/ACV sources; and c) training standards and certification.

### A. Distributor Discretion in Resolving Distribution System ACC/ACV Contributions

The Board is aware that at present, distributors have discretion - within the scope of applicable electrical safety requirements and design standards - over how best to reduce and/or limit distribution system contributions to ACC/ACV. The same is true among the jurisdictions surveyed for the purposes of this consultation, with the exception of Wisconsin, which places conditions on the installation of primary/secondary neutral isolators (including VTNI).<sup>79</sup> Wisconsin is also the only jurisdiction among those surveyed where distributors are allowed to address their ‘share’ of ACC/ACV by undertaking remediation on the farmer’s side of the ownership demarcation point. This is analogous to the approach taken in Ontario in the 1980s and 90s when ‘tingle voltage filters’ manufactured by the Hammond

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<sup>76</sup> Hydro One; p. 9; OFA; p. 5.

<sup>77</sup> WNHI; p. 2.

<sup>78</sup> As described by Fraser; p. 7.

<sup>79</sup> See the DP; p. 63 or BDR 2008; p. 53.

company were installed in barns to eliminate the passage of current between the distributor's and farm's neutral wires.

The Board notes that most written comments expressed a preference for allowing distributors latitude in determining the best way to deal with each case. One stakeholder pointed out that distributors may be required to adapt quickly to developments in remediation devices and techniques.<sup>80</sup> Hydro One underlined the importance of ensuring that the distributor is accountable for meeting quality of supply requirements, adding that each case "needs to be evaluated on its own merits," and that general restrictions might "fail to recognize specific circumstances that distributors will encounter".<sup>81</sup>

Several comments focussed on isolation devices (e.g. VTNI), variously describing them as the most effective and least costly tool in the distributor's toolbox. There were differences however, in terms of whether isolators should be *allowed*<sup>82</sup> (perhaps with conditions "to ensure that isolation is not being used to mask a defective primary distribution system"<sup>83</sup>) or *required*.<sup>84</sup>

Finally, one stakeholder noted that some cases may not be resolvable through corrective action on the distribution system. In such cases, it was argued that distributors should be obliged to "undertake the full cost of correction on the [farmer's] property."<sup>85</sup>

Given that each case of farm stray voltage can have unique characteristics, that consideration must be given to the condition and operation of a distribution circuit when making decisions on how to address a given case, and that safety-related codes and practices must also be considered, the Board believes that distributors should have discretion as to, and be accountable for, choosing the most appropriate and cost effective way to resolve farm stray voltage problems.

#### B. Responsibility for Investigating On-Farm ACC/ACV Sources

In relation to farm stray voltage investigations, the DP raised the question as to whether distributors should be responsible for identifying on-farm stray voltage sources. It is important to note that the issue here is responsibility for on-farm source *identification* and not *remediation*. This issue arises from the fact that, as mentioned above, the farm and distribution grounding and neutral systems are interconnected through their respective neutral conductors and via the grounding/earth pathway. Therefore, ACC/ACV measured at an animal contact

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<sup>80</sup> DFO; p. 9.

<sup>81</sup> Hydro One; p. 9.

<sup>82</sup> Williston; p. 3; and NB Power; p. 3.

<sup>83</sup> Williston; p. 3.

<sup>84</sup> Brindley; p. 4 and Lantz; p. 2.

<sup>85</sup> OFA; p. 3.

location could potentially originate with a source other than the distributor's distribution system.

By way of context, as noted in the DP, there is no consistency across jurisdictions that regulate distributors in this matter: some require that distributors perform on-farm tests that identify, in the process, on-farm ACC/ACV sources, while others do not. NB power and Hydro Québec advise, respectively, that they will "work with a Customer's electrical contractor" or "provide expertise and conduct tests" to identify on-farm ACC/ACV sources. Two written comments implied that distribution system and on-farm testing is best carried out by the distributor and farm customer's contractor at the same time in a cooperative manner,<sup>86</sup> and other participants mentioned the benefits of conducting on- and off-farm testing simultaneously.<sup>87</sup>

Generally, written comments received express views on both sides of the issue.<sup>88</sup> One sentiment that resonated with a number of interested parties was that "[a] clear delineation between the [distributor's] and the customer's responsibility needs to be established."<sup>89</sup> Other participants suggested no such distinction be made,<sup>90</sup> one arguing that the expertise and equipment available to distributor personnel may not be accessible to farm customers through private contractors.<sup>91</sup>

Comments by the EDA and the ESA suggest that distributor/customer testing responsibilities should be separated at the ownership demarcation point, in the way responsibilities for meeting electrical safety regulations and codes are divided between the two.<sup>92</sup>

Hydro One expresses concerns for liability, citing "the implications of having a distributor's staff working in an environment that is outside of the distributor's control (e.g. barns), which could put employee safety at risk due to an unknown or possibly even undesirable working environment."<sup>93</sup>

Others indicated that under certain conditions, such as when tests for distribution system sources reveal that on-farm sources are likely as well, distributors should or could do the required on-farm testing with the consent or at the request of the farm customer.<sup>94</sup> Stakeholder positions on how the cost of on-farm testing

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<sup>86</sup> Hydro One; p. 7; Williston; p. 4.

<sup>87</sup> NB Power; p. 3; ESA; p. 7.

<sup>88</sup> DP; p. 81.

<sup>89</sup> WNHI; p. 1. See also EDA; p. 4; and ESA; p. 7; Hydro One; p. 7.

<sup>90</sup> Brindley; p. 3; Fraser; p. 8.

<sup>91</sup> Brindley; p. 3.

<sup>92</sup> EDA; p. 4; ESA; p. 7. The ESA also states that "[o]n-farm sources fall within the scope of the Ontario Electrical Safety Code" and that "[o]n-farm source investigation work needs to be performed by persons or organizations appointed by ESA." ESA; p. 5.

<sup>93</sup> Hydro One; p. 7.

<sup>94</sup> OFA; p. 4 and DFO; p. 4.

should be allocated varied. Cost sharing is indicated if both the distributor and farm systems are contributing sources suggested one stakeholder;<sup>95</sup> while another felt that the farmer should bear full responsibility if the distribution system does not exceed the selected contribution threshold.<sup>96</sup> A third stakeholder thought the distributor should be responsible for the entire investigation process.<sup>97</sup>

The Board believes that it is important that there be clarity as to the division of roles and responsibilities as between distributors and livestock farm customers in relation to farm stray voltage. In the Board's view, it is appropriate that distributors be responsible for identifying and addressing distribution system sources of farm stray voltage. This is in keeping with a distributor's mandate and functions in relation to ownership and operation of its distribution system. It is also the Board's view that responsibility in relation to farm stray voltage that arises from sources other than a distribution system should remain with the livestock farm customer.

### C. Training Standards and Certification

Of the jurisdictions surveyed for the present purpose, only one (Idaho) has established specific training standards,<sup>98</sup> and none requires personnel carrying out investigations and/or remediation to be certified by an authoritative body like an educational institution, industry or professional association, etc.<sup>99</sup>

However, the Board accepts that minimum training standards might be a reasonable extension of the requirement that personnel responsible for investigating and addressing distributor contributions to ACC/ACV are competent in such activities, and that certification of a successful participation in a training program would represent formal confirmation of both participation and the achievement of an acceptable level of competence.

Regarding minimum training standards, two sets of written comments expressed arguments in favour, suggesting that standards ensure competence, cost effectiveness, consistency<sup>100</sup> and under certain circumstances, continuity.<sup>101</sup> Four other written comments on this issue indicated a preference for regulatory measures that include recommendations limited to the general content and perhaps the duration of any training otherwise deemed to be required.<sup>102</sup>

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<sup>95</sup> OFA; p. 4.

<sup>96</sup> DFO; p. 4.

<sup>97</sup> Brindley; p. 1 and p. 3; Fraser; pp. 7 - 8.

<sup>98</sup> DP; p. 84.

<sup>99</sup> DP; p. 86.

<sup>100</sup> These features suggested by Fraser; p. 9.

<sup>101</sup> Brindley; p. 3.

<sup>102</sup> NB Power; p. 4; OFA; p. 4; WNHI; p. 2; and Williston; p. 5.

As for certification, one written comment argued in favour of mandatory certification for farm stray voltage investigators, citing the number of “so-called stray voltage ‘experts’...running around the country making questionable recommendations.”<sup>103</sup> Another saw certification as a discretionary, higher level of qualification awarded on the basis of extra training and the achievement of a specified number of investigations.<sup>104</sup> Two comments preferred that certification be recommended rather than mandatory, citing concerns over the expense a certification process would add to the total cost of training distributor personnel.<sup>105</sup> Finally, one participant distinguished between personnel in charge of investigations and those carrying out the work, suggesting that there is a need to certify only the former, given the complexities involved.<sup>106</sup>

The Board is of the view that a determination on the merits of creating obligations regarding training standards and certification requirements must await the emergence in Ontario of formal farm stray voltage training programs and related certifications.<sup>107</sup>

### **Anticipated Costs and Benefits of the Proposed Amendments**

Ontario distributors have been responding to livestock farm customer requests in relation to farm stray voltage for many years. The Board has considered the current practices of electricity distributors in developing the proposed Amendments. The proposed Amendments will require distributors to incur costs over and above current costs where the activities prescribed in the proposed Amendments differ from distributor current practice in relation to:

- the investigation procedure used;
- the target to be achieved through remediation activities;
- the competence of personnel responsible for farm stray voltage investigations and remediation;
- the existence and content of a farm stray voltage customer response procedure;
- record keeping in relation to farm stray voltage investigations; and
- written notification to livestock farm customers as to how to obtain information on farm stray voltage, a copy of the distributor’s related

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<sup>103</sup> DFO; p. 5.

<sup>104</sup> Brindley; pp. 3 - 4.

<sup>105</sup> EDA; p. 7 and WNHI; p. 2.

<sup>106</sup> ESA; p. 6.

<sup>107</sup> The ESA suggests that investigators trained by the ESA “could obtain certification” and that “Part VIII of the *Electricity Act*, 1998 provides a mechanism for the creation of this certification requirement and associated training through regulation.” ESA; p. 6.

customer response procedure, and a copy of the distributor's dispute resolution procedure.

The Board believes that the incremental costs accruing to distributors from implementing the proposed Amendments will be offset by the benefits associated with enhanced assurance that distributor responses to farm stray voltage requests are efficient, consistent and effective.

### **Coming into Force**

The Board proposes that the Amendments to the Distribution System Code as set out in Appendix A come into force three months from the date on which Appendix H is published on the Board's website after having been made by the Board. As noted earlier in this Notice, Appendix H will be released for notice and comment on a later date.

### **Cost Awards**

Cost awards will be available to eligible persons under section 30 of the *Ontario Energy Board Act, 1998* in relation to the provision of comments on the proposed Amendments to the Code set out in Appendix A, **to a maximum of 15 hours**. Appendix B contains important information regarding cost awards for this notice and comment process, including in relation to eligibility requests and objections. In order to facilitate a timely decision on cost eligibility, the deadlines for filing cost eligibility requests and objections will be strictly enforced.

In its Decision on Cost Eligibility dated October 11, 2007 and its Supplementary Decision on Cost Eligibility dated November 29, 2007, the Board determined that the following participants were eligible for cost awards in relation to their participation in earlier phases of this consultation:

Energy Probe Foundation  
Wireless Electrical and Electromagnetic Pollution

**These participants will be considered eligible for costs in relation to this notice and comment process, and need not submit a further request for cost eligibility.**

Costs awarded will be recovered from all licensed electricity distributors based on their respective distribution revenues, with the exception of the following distributors that have identified themselves to the Board as not having farm customers:

E.L.K. Energy Inc.  
Orillia Power  
Toronto Hydro

EnWin Utilities Limited  
PowerStream Inc.  
Woodstock Hydro Services Inc.

### **Invitation to Comment**

All interested parties are invited to submit written comments on the proposed Amendments by **December 5, 2008**. Three (3) paper copies of each filing must be provided, and should be sent to:

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

The Board requests that interested parties make every effort to provide electronic copies of their filings in searchable/unrestricted Adobe Acrobat (PDF) format, and to submit their filings through the Board's web portal at [www.errr.oeb.gov.on.ca](http://www.errr.oeb.gov.on.ca). A user ID is required to submit documents through the Board's web portal. If you do not have a user ID, please visit the "e-filings services" webpage on the Board's website at [www.oeb.gov.on.ca](http://www.oeb.gov.on.ca), and fill out a user ID password request. Additionally, interested parties are requested to follow the document naming conventions and document submission standards outlined in the document entitled "RESS Document Preparation – A Quick Guide" also found on the "e-filing services" webpage. If the Board's web portal is not available, electronic copies of filings may be filed by e-mail at [boardsec@oeb.gov.on.ca](mailto:boardsec@oeb.gov.on.ca).

Those that do not have internet access should provide a CD or diskette containing their filing in PDF format.

Filings to the Board must be received by the Board Secretary by **4:45 p.m.** on the required date. They must quote file number EB-2007-0709 and include the name, address, telephone number and, where available, e-mail address and fax number of the sender.

This Notice, including the attached proposed Amendments to the Code and all written comments received by the Board in response to this Notice, will be available for public viewing on the Board's web site at [www.oeb.gov.on.ca](http://www.oeb.gov.on.ca) and at the office of the Board during normal business hours.

If you have any questions regarding the proposed Amendments described in this Notice, please contact Takis Plagiannakos at [takis.plagiannakos@oeb.gov.on.ca](mailto:takis.plagiannakos@oeb.gov.on.ca) or at 416-440-7680. The Board's toll free number is 1-888-632-6273.

**DATED** at Toronto, October 31, 2008.

ONTARIO ENERGY BOARD

*Original Signed By*

John Pickernell  
Assistant Board Secretary

Appendix: A - Proposed Amendments to the Distribution System Code  
Appendix B - Cost Awards

## Appendix A

To Notice Dated October 31, 2008

### Proposed Amendments to the Distribution System Code

1. **Section 1.7 of the Distribution System Code is amended by adding the following text below the last paragraph in that section:**

Section 4.7 comes into force on the date that is three months from the date on which Appendix H referred to in sections 4.7.2 and 4.7.3 is published on the Board's website after having been made by the Board.

2. **Section 4.1.3 of Distribution System Code is amended by replacing the word "A" at the beginning of that section with the following:**

Subject to section 4.7, a

3. **Section 4.1.4 of the Distribution System Code is amended by replacing the word "If" at the beginning of that section with the following:**

Except in relation to an investigation conducted under section 4.7, if

4. **Section 4 of the Distribution System Code is amended by adding the following immediately after section 4.6.5:**

#### **4.7 Farm Stray Voltage**

##### **4.7.1 In this section 4.7:**

- ACC—means animal contact current, being the steady state 60 Hz (including harmonics thereof) root mean square alternating current when measured through a 500 Ohm resistor connected between animal contact points;
- ACV—means animal contact voltage, being the steady state 60 Hz (including harmonics thereof) root mean square alternating current voltage when measured in parallel with a 500 Ohm resistor connected between animal contact points;
- "farm stray voltage" means ACC or ACV occurring at a location on a farm where livestock make contact with it; and

- “livestock farm customer” in respect of a distributor means any customer of the distributor that is engaged principally in livestock husbandry in an area zoned for agricultural use.

4.7.2 A distributor shall initiate a farm stray voltage investigation using the procedure set out in Appendix H where a livestock farm customer provides the distributor with information that reasonably indicates that farm stray voltage may be adversely affecting the operation of the livestock farm customer’s farm.

4.7.3 Where an investigation initiated under section 4.7.2 reveals that either:

a) ACC on the farm exceeds 2.0 milliamperes; or

b) ACV on the farm exceeds 1.0 volt,

the distributor shall conduct tests in accordance with the investigation procedure set out in Appendix H to determine whether and the extent to which the distributor’s distribution system is contributing to farm stray voltage measured on the farm.

4.7.4 Where the tests referred to in section 4.7.3 reveal that the distributor’s distribution system is contributing more than 1 mA ACC or 0.5 V ACV to farm stray voltage on a farm, the distributor shall take such steps as may be required to ensure that such contribution does not exceed 1 mA ACC or 0.5 V ACV.

4.7.5 A distributor shall ensure that persons responsible for investigating, analyzing and determining the appropriate means of remediating farm stray voltage situations on the distributor’s behalf for the purposes of meeting the distributor’s obligations under this section 4.7 have competency in performing these activities. Competency may be based on recognized qualification requirements that include a training course that meets the requirements of the tasks to be performed. Services provided in relation to these activities by a person that does not have the recognized qualification requirements shall be reviewed, affirmed and documented by a person with exhibited competency.

4.7.6 A distributor serving livestock farm customers shall document, post on its web site and otherwise make available to any person on request, and file with the Board upon request, a farm stray voltage customer response procedure that describes the steps involved in the distributor’s response to farm stray voltage complaints and inquiries. At a minimum, the customer response procedure must indicate:

- a) how and to whom farm stray voltage complaints and inquiries should be made by livestock farm customers;
- b) the types of information required by the distributor regarding the basis of the livestock farm customer's concern that ACC/ACV from the distributor's system is affecting farm operations; and
- c) the estimated amount of time the distributor requires following receipt of a complaint or inquiry to contact the livestock farm customer for the purpose of scheduling a site visit for the purpose of initiating an investigation where an investigation is required.

4.7.7 A distributor shall record, retain and provide to the Board, on request and in the form and manner required by the Board, the following information:

- a) the name and contact information of each livestock farm customer that submits a farm stray voltage complaint to the distributor, the date of the complaint and the date on which the matter was considered closed by the distributor; and
- b) for each farm stray voltage investigation initiated by the distributor:
  - site information for the livestock farm customer's farm, including location; the identity and design characteristics of the circuit(s) supplying the site; and distance of the site from the circuit substation and from the end of the circuit;
  - test measurement values recorded in the process of conducting the investigation and of any required remediation activities; and
  - identified ACC or ACV source(s) and distribution system contribution levels; any remediation measures taken; and the total cost of the investigation and of any remediation measures taken.

4.7.8 A distributor serving livestock farm customers shall, not less than annually, provide written notice to all livestock farm customers in its service area describing how they can obtain the following from the distributor:

- a) information on what farm stray voltage is, what causes it, and common ways of addressing distribution system contributions to it;
- b) a copy of the distributor's farm stray voltage customer response procedure referred to in section 4.7.6; and
- c) a copy of the distributor's dispute resolution process set out in its Conditions of Service.

Such notice may be given by including an insert with at least one bill submitted to livestock farm customers or by any other means as may reasonably be expected to bring the information to the attention of livestock farm customers. Posting of the information or of notice of the availability of the information on the distributor's website alone shall not constitute sufficient written notice for the purposes of this section.

## Appendix B

To Notice Dated October 31, 2008

### Cost Awards

#### Cost Award Eligibility

The Board will determine eligibility for costs in accordance with its *Practice Direction on Cost Awards*. Any person requesting cost eligibility must file with the Board a written submission to that effect by **November 14, 2008**, identifying the nature of the person's interest in this process and the grounds on which the person believes that it is eligible for an award of costs (including addressing the Board's cost eligibility criteria as set out in section 3 of the Board's *Practice Direction on Cost Awards*). An explanation of any other funding to which the person has access must also be provided, as should the name and credentials of any lawyer, analyst or consultant that the person intends to retain, if known. All requests for cost eligibility will be posted on the Board's website.

Licensed electricity distributors will be provided with an opportunity to object to any of the requests for cost award eligibility. If an electricity distributor has any objections to any of the requests for cost eligibility, such objections must be filed with the Board by **November 21, 2008**. Any objections will be posted on the Board's website. The Board will then make a final determination on the cost eligibility of the requesting parties.

#### Eligible Activities

Cost awards will be available in relation to the provision of written comments on the proposed Amendments to the Code as set out in Appendix A, to a maximum of **15 hours**.

#### Cost Awards

When determining the amount of the cost awards, the Board will apply the principles set out in section 5 of its *Practice Direction on Cost Awards*. The maximum hourly rates set out in the Board's Cost Awards Tariff will also be applied. The Board expects that groups representing the same interests or class of persons will make every effort to communicate and co-ordinate their participation in this process.

The Board will use the process set out in section 12 of its *Practice Direction on Cost Awards* to implement the payment of the cost awards. Therefore, the Board will act as a clearing house for all payments of cost awards in this process.

For more information on this process, please see the Board's *Practice Direction on Cost Awards* and the October 27, 2005 letter regarding the rationale for the Board acting as a clearing house for the cost award payments. These documents can be found on the Board's website at [www.oeb.gov.on.ca](http://www.oeb.gov.on.ca) on the "Rules, Codes, Guidelines and Forms" webpage which can be found in the "Industry Relations" drop-down menu.