

What is Stray Voltage?

Farm 'stray' or 'tingle' voltages are small electrical potentials between metal stabling/equipment and floor surfaces. Animals that make contact between these surfaces may receive a tingle or mild shock that disturbs the animals' normal behaviour and can ultimately reduce the efficiency of the farming operation.

An Innisfil Hydro livestock customer may ask Innisfil Hydro to initiate a farm stray voltage investigation using the procedure set out in Appendix H (attached), where a livestock farm customer provides information that reasonably indicates that farm stray voltage may be adversely affecting the operation of the customer's livestock farm.

What causes Stray Voltage?

Stray voltage can be produced by a variety of on-farm and off-farm sources.

- **On-the-farm sources:**
Unbalanced farm electrical system loading, faulty wiring, improper or poor grounding, defective equipment or voltages from gas pipelines or telephone lines are all possible sources. Innisfil Hydro's neutral system is connected to a farm's grounding system. While this bond protects from shocks caused by faulty electrical equipment and lightning strikes, it may result in a stray voltages on grounded farm equipment such as feeders, watering devices, metal stabling, metal grates, milk pipelines and wet concrete floors.
- **Off-farm sources:**
In a properly functioning electrical system, some voltage exists between the neutral system (ground conductors) and the earth. The level of this voltage can change depending on changes in environmental conditions, electrical loading, and other factors.

Common Ways of Reducing Farm Stray Voltage

Common ways of reducing tingle voltage would be to reduce grounding resistance of the system grounds and system neutral and by repairing faulty electrical equipment and wiring. An alternative solution, particularly applicable to milking parlours, is the installation of an equi-potential grid. The grid consists of a welded wire mesh, embedded in the concrete of the cow platform in the parlour and in other areas where cows contact bonded stabling or feeding or water devices. The mesh is bonded to the neutral, thereby raising all contact to the potential of the neutral and eliminating exposure to stray voltage. Equi-potential grids are required in new milking parlour construction under the Canadian Electric Code and are included in Canada Plan Service milking parlour plans. The grid offers the added advantage of improving system grounding and eliminating electric shock hazard for livestock on the grid from all sources including lightning.

Stray Voltage Response Procedure

If you think you have a stray voltage problem, call Innisfil Hydro Customer Service at (705) 431-4321 to set up an appointment. It is estimated that Innisfil Hydro requires five business days or less following receipt of a complaint or inquiry to contact the livestock farm customer for scheduling a site visit for the purpose of initiating an investigation.

Information required from the livestock farm customer includes:

1. Are there any of the following symptoms noticed for dairy cows?
 - Reluctance to enter milking parlour
 - Reduced water or feed intake
 - Lowered milk production
 - Nervous or aggressive behaviour
 - Uneven and incomplete milkout
 - Increased mastitis
 - Reduced growth
2. Any recent changes to electrical circuits, motors or hardware?
3. Any recent changes or additions to barn operations?
4. Any history of past precedence of stray voltage problems?

Office hours are Monday to Friday 8:30 a.m. to 4:30 p.m.

Innisfil Hydro's Dispute Resolution Process is available on page 9 of the Conditions of Service document, <http://www.innisfilhydro.com/Portals/0/Conditions-of-Service-Version-2008.pdf>

For more information

For additional information on the effects of stray voltage on livestock see:

Appendix H, Ontario Energy Board's Distribution System Code
http://www.oeb.gov.on.ca/OEB/Documents/Regulatory/Distribution_System_Code_AppH.pdf

Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
<http://www.omafra.gov.on.ca/english/livestock/dairy/facts/strayvol.htm>