

## Safety Barrier/Supporting Structures & Grounding Requirements of LDC Energized Conductors and Live Parts

### Overview

The following bulletin provides direction with regards to infrastructure and equipment that is installed on the LDC side of an ownership demarcation point or is associated with LDC embedded equipment. For more information, see DB-07-05-v1 Demarcation Point Bulletin.

Ont. Reg. 22/04 applies to a distribution system up to the ownership demarcation point except for revenue metering equipment and associated equipment. The Regulation does not include LDC embedded equipment such as a transformer. Permitting embedded transformers is a deviation to Reg. 22/04 as a historical practice. This deviation only applies to transformers and its associated equipment.

### Regulation 22/04 Excerpts

#### Grounding Requirements – Section 4

*(3) All electrical installations operating at 750 volts or below that are not a direct part of a distribution system shall meet the following safety standards:*

*6. Metal parts of an installation that are not intended to be energized shall be **effectively grounded**.*

*(4) All overhead distribution lines, including secondary distribution lines, shall meet the following safety standards:*

*4. Metal parts of the installation that are not intended to be energized and that are accessible to unauthorized persons shall be **effectively grounded**.*

*(5) All underground distribution lines, including secondary distribution lines, shall meet the following safety standards:*

*4. Metal parts of the installation that are not intended to be energized and that are accessible to unauthorized persons shall be **effectively grounded**.*

*(6) Distribution stations shall meet the following safety standards:*

*3. Metal parts of the installation that are not intended to be energized and that are accessible to unauthorized persons shall be **effectively grounded**.*

## Safety Barrier/Supporting Structure Requirements – Section 4

(3) *All electrical installations operating at 750 volts or below that are not a direct part of a distribution system shall meet the following safety standards:*

*3. Live conductors shall be adequately insulated or **barriered** to prevent inadvertent contact.*

(4) *All overhead distribution lines, including secondary distribution lines, shall meet the following safety standards:*

*3. Energized conductors and live parts shall be **barriered** such that vegetation, equipment or unauthorized persons do not come in contact with them or draw arcs under reasonably foreseeable circumstances.*

*5. Structures supporting energized conductors and live parts shall have **sufficient strength** to withstand the loads imposed on the structure by electrical equipment and weather loadings.*

(5) *All underground distribution lines, including secondary distribution lines, shall meet the following safety standards:*

*3. Energized conductors and live parts shall be **barriered** such that equipment or unauthorized persons do not come into contact with them or draw arcs under reasonably foreseeable circumstances.*

(6) *Distribution stations shall meet the following safety standards:*

*4. Energized conductors and live parts shall be **barriered** such that equipment or unauthorized persons do not contact them or draw arcs under reasonably foreseeable circumstances.*

## **ESA Direction**

The excerpts above require that LDC owned (i) metal parts of the installation that are not intended to be energized and that are accessible to unauthorized persons, (ii) energized conductors and (iii) live parts (electrical equipment), which fall under the scope of Regulation 22/04, shall be effectively grounded, barriered and supported for safety (as applicable) in order for an LDC to meet the requirements of Regulation 22/04. This responsibility includes any work that is in place to provide for the safe operation of the LDC equipment. This may include guards, coverings, conduit, ducts, trench backfill, groundings, electrodes, bonding, poles, fencing, chambers (vaults), and similar safety equipment or infrastructure. If the LDC equipment is installed by a non-LDC under the alternate bid option, and where it has been accepted and under the control of the LDC, then the LDC shall meet these safety requirements. The LDC is responsible for

ensuring safety is adequate for the designated purpose, in that there are **no obvious structural problems and hazards** with this safety equipment and infrastructure.

## Examples

1. Underground Residential Service where the ownership demarcation point is declared at the line side of the customer's meter base. In this scenario the LDC is responsible for ensuring that all infrastructure and equipment providing a barrier to LDC owned energized conductors, including conduit to the meter base, duct system and trench backfill are adequate. Even in the event that a non-LDC is responsible for the work.
2. Chamber, Vault or LDC Owned Pad-mounted Transformer where the LDC sets the ownership demarcation point at the secondary terminal(s) of the transformer(s). In this scenario the LDC is responsible for ensuring adequate barriers to all energized conductors and live parts of the LDC equipment, including: the ability of the chamber, vault or transformer's foundation to act as a barrier to the energized equipment; and any required grounding and bonding of LDC equipment.
3. LDC Owned Pad-mounted Transformer. In this scenario the LDC is responsible for ensuring that the transformer(s) is effectively grounded for safety. Even in the event that a non-LDC is responsible for installation of the ground loop, electrodes or similar grounding means.
4. LDC Owned Embedded Pole-mounted Transformers. In this scenario the LDC is responsible for ensuring that the transformer is structurally supported and effectively grounded. Even in the event that a non-LDC is responsible for installation of the supporting structure (pole), down ground, electrode(s) or similar grounding means.

## ESA Recommends

ESA recommends LDCs review their current practices to ensure that affected processes are consistent with the direction stated above.

- Before putting a distribution system into use, all work performed on the LDC side of an ownership demarcation point or for LDC embedded equipment, which is installed for the safe operation of equipment, shall be inspected & approved to ensure the safety standards in Section 4 of Regulation 22/04 are met, and is included as per the LDC's Construction Verification Program. This may include guards, coverings, conduit, ducts, trench backfill, grounds, electrodes, bonds, poles, fencing, chambers (vaults), and similar grounding, safety barrier or structural support means.