Health and Safety Standard

MINIMUM APPROACH DISTANCE

1 PURPOSE

This standard identifies SaskPower's requirements regarding the permissible distance between exposed live electrical lines or equipment and any part of a worker's body, material or tools being handled, or equipment being operated. The purpose is to reduce the risk of electrical flashover or inadvertent contact while working near or on exposed energized lines or equipment.

2 SCOPE

The scope of this standard defines the minimum approach distances to implement for maintaining the necessary electrical distance to mitigate electrical flashover or inadvertent contact with exposed energized apparatus.

This standard applies to all work being conducted near or on exposed energized electrical lines or equipment in excess of 50 volts (RMS AC or DC) by workers on behalf of SaskPower.

This standard does not apply to work being conducted near or on exposed electrical lines or equipment that have been de-energized to effectively control hazardous energies through the application of the appropriate Standard Protection Code permit.

This standard outlines the minimum requirements that shall be met or exceeded by SaskPower workers and contractors. Failure to comply may result in injuries, damage to equipment and property, performance management or any combination thereof.

The use of the word "shall" within this standard denotes a mandatory action, whereas the use of the word "should" or "may" denotes a recommended action.

3 DEFINITIONS

The following definitions apply to this standard:

Apparatus - All lines and equipment pertaining to the generation, transmission, distribution, and use of electrical energy.

Energized (Live) - At a potential significantly different from that of ground (earth) at the worksite and which presents an electrical hazard.

Exposed - For lines and equipment: not enclosed, insulated or otherwise covered.

Minimum Approach Distance - The minimum distance in air to be maintained between any part of the body of a worker, including any object (except tools appropriate for live working) being handled directly, and any part(s) at different potential(s).

Near - For the purposes of electrical operations, distance at which there is a possibility of inadvertent contact or electrical flashover with exposed energized lines or equipment.

Qualified Electrical Worker - A person who:

A. Meets the requirements outlined in Part 30-16 (1) "qualified electrical worker" of *The Occupational Health and Safety Regulations, 2020*; or
B. Is a SaskPower employee and falls within one of the current exemptions related to Part 30-16 of *The Occupational Health and Safety Regulations, 2020*; and

And who must be:

i. Trained to recognize hazards associated with exposed energized electrical lines and equipment;
ii. Trained and experienced to work in accordance with safe work practices while performing specific duties assigned by the utility; and
iii. Authorized to access the required parts of the electric utility system, including facility/site orientation.

Voltage - For AC (Alternating Current) circuits, voltage shall be the nominal Phase to Phase RMS voltage. For DC (Direct Current) circuits, voltage shall be the nominal DC voltage.

4 REQUIREMENTS

Minimum approach distances have been established by SaskPower based on the methodology adopted from IEEE 516 industry standard while complying with the legal requirements outlined by *The Occupational Health and Safety Regulations, 2020*. The minimum approach distances have been approved by a professional engineer and meet the requirements outlined in the CAN/ULC-S801-14 industry standard.

The following table provides minimum approach distances grouped by nominal voltages.

Nominal ph to ph Voltages*	Qualified Electrical Worker Minimum Approach Distance MAD		Qualified Electrical Worker Minimum Helicopter Approach Distance MHAD	
	ph to gnd	ph to ph	ph to gnd	ph to ph
300 V	Avoid Contact		-	-
750 V	0.35 m	-	-	-
4.16 kV	0.65 m	-	-	-
15 kV	0.70 m	-	-	-
25 kV	0.75 m	-	-	-
34.5 kV	0.80 m	-	-	-
72 kV	0.95 m	1.25 m	1.05 m	1.35 m
138 kV	1.20 m	1.75 m	1.35 m	1.90 m
230 kV	1.80 m	2.80 m	2.00 m	3.10 m

* For nominal voltages not listed use the next higher voltage in the table.

Table 1 – Minimum Approach Distance (MAD)

For voltages of 750 volts or less, workers who are not Qualified Electrical Workers, but meet all the requirements of clauses i), ii) and iii) of the definition of a Qualified Electrical Worker in Section 3 shall be allowed to approach exposed energized apparatus up to the distances specified in Table 1, but no closer.

The following describes, including examples, the application of the minimum approach distances listed in Table 1.

MAD (ph to gnd) – the distance a worker shall maintain:

a) to exposed energized apparatus; or

b) to any grounded object when working at line potential.

E.g.: A worker performing liveline barehand work on one conductor shall maintain MAD (ph to gnd) to any adjacent grounded objects.

MAD (ph to ph) – the distance a worker, who is working at phase potential shall maintain to an adjacent exposed energized phase or circuit.

E.g.: A worker performing liveline barehand work on one conductor shall maintain MAD (ph to ph) to any adjacent exposed energized objects of another phase or circuit.

MHAD (ph to gnd) – the distance a worker and the helicopter shall maintain:

a) to exposed energized apparatus; or

b) to any grounded object when working at line potential.

MHAD (ph to ph) - the distance a worker and the helicopter, that is working at phase potential shall maintain to an adjacent exposed energized phase or circuit.

Workers shall not allow their body or any conductive object they are using to encroach within the applicable minimum approach distance when performing work near or on exposed energized electrical lines or equipment except as specifically allowed below.

Qualified Electrical Workers shall only be permitted to perform work on or near exposed energized electrical lines or equipment at distances closer than those specified in the table above when:

- Utilizing insulating barriers on lines and equipment operating at 25 kV or less; or
- Performing the work in accordance with approved written work procedures utilizing equipment and personnel protective equipment intended for the application.

Where the voltage exceeds 750V, workers who are not Qualified Electrical workers shall fall within the classification of an unqualified persons with the exception of workers who are classified as Utility Tree Trimmer as per Part 30-16(1) “utility tree trimmer” of *The Occupational Health and Safety Regulations, 2020*. All Utility Tree Trimmers shall perform their duties in compliance with *The Occupational Health and Safety Regulations, 2020*.

Under no circumstances shall an unqualified person allow their body, material, or tool they are handling to come closer to the exposed energized conductor than the distance specified in the “Non-electrical Workers, Material, Equipment” column of Table 19 in *The Occupational Health and Safety Regulations, 2020* unless the person is undertaking a specific one-time activity under the direct supervision of a Qualified Electrical Worker in which case they may approach within the same distance as that worker.

For the detailed calculations and parameters used to establish the various minimum approach distances outlined in Table 1 refer to ES-STD-001-0, Minimum Approach Distance Calculations for SaskPower Facilities.

5 IMPLEMENTATION

The requirements of this version of the standard are to be met within six months of the approval date at which time the previous version will be superseded.

6 RESOURCES

6.1 INTERNAL RESOURCES

Related Policies:	Hazard Aspect and Risk Assessment Policy
Related Standards:	Hazard Aspect and Risk Assessment Standard
Additional Information:	ES-STD-001-0, Minimum Approach Distance Calculations for SaskPower Facilities Safety Briefing 45 – Minimum Approach Distances

6.2 EXTERNAL RESOURCES

Related Legislation:	*The Occupational Health and Safety Regulations, 2020*
Related Standards:	CAN/ULC-S801-14, Standard on Electric Utility Workplace Electrical Safety for Generation, Transmission, and Distribution IEEE 516-2009, Guide for Maintenance Methods on Energized Power Lines

Ownership

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