
Part 17 Overhead Power Lines

Highlights

- The safe limit of approach distances have been made consistent with the 2002 edition of Alberta's *Electrical and Communication Utility Code (ECUC)*.
- Section 226 clarifies that the safe limit of approach distances do not apply to loads, equipment, or buildings less than 4.15 metres in height while they are being transported beneath energized overhead power lines.
- Section 227 recognizes that special approach distances apply to electric utility workers, electric utility trimmers and qualified electrical utility workers.

Requirements

Section 225 Safe limit of approach distances

Subsection 225(1)

Safe limit of approach distances for overhead power lines are intended to prevent power line contacts, injuries and fatalities (see the "Overview" to this Part for a discussion of power line contacts).

If work is done or equipment is operated within 7 metres of an energized overhead power line, the employer must contact the power line operator to determine the voltage of the power line. As shown in Table 17.1, the power line voltage determines the safe approach distance. Until the power line operator verifies the voltage, the employer must maintain a safe clearance distance of 7 metres. The distances listed in Schedule 4 have been taken from Alberta's *Electrical and Communication Utility Code (ECUC)*, 2nd Edition, 2002.

Table 17.1 Safe limit of approach distances from overhead power lines for persons and equipment
(appears as Schedule 4 in the OHS Code)

Operating voltage between conductors of overhead power line	Safe limit of approach distance for persons and equipment
0-750 volts Insulated or polyethylene covered conductors (1)	300 millimetres
0-750 volts Bare, uninsulated	1.0 metre
Above 750 volts Insulated conductors (1) (2)	1.0 metre
750 volts-40 kilovolts	3.0 metres
69 kilovolts, 72 kilovolts	3.5 metres
138 kilovolts, 144 kilovolts	4.0 metres
230 kilovolts, 260 kilovolts	5.0 metres
500 kilovolts	7.0 metres

Notes:

- (1) Conductors must be insulated or covered throughout their entire length to comply with this group.
- (2) Conductors must be manufactured to rated and tested insulation levels.

Subsection 225(1.1)

An employer must ensure that the appropriate distance as listed in Schedule 4 is maintained as a limit at all times and that no worker or equipment comes any closer than that distance. This can only be varied with the permission and assistance of the power line operator in accordance with subsection 225(2).

Subsection 225(2)

Situations may arise in which work must be done or equipment operated near an energized power line at distances less than the safe limit of approach distance for that particular voltage. In such cases, the employer must notify the operator of the power line before beginning the work and obtain the operator's assistance in protecting workers involved in the work. The operator may protect workers by de-energizing the power line, relocating it, isolating it, or performing some other equally effective action.

Subsection 225(3)

This subsection is intended to prevent safe limit of approach distances being reduced by piles of earth or other materials placed beneath or adjacent to an overhead power line.

Subsection 225(4)

As required by section 8 of the OHS Code, the employer is responsible for making workers aware of the hazards associated with work near energized overhead power lines. The employer should make workers aware of the safe limit of approach distances included in the OHS Code. Workers must follow the employer's directions to maintain the appropriate safe clearance distances.

Section 226 Transported loads, equipment and buildings

This section clarifies that the distances listed in Schedule 4 do not apply to loads, equipment, or buildings less than 4.15 metres in height while they are being transported beneath energized overhead power lines. Examples of such situations include a tractor trailer passing beneath a power line or a building being transported on a flatbed trailer along a highway and passing beneath power lines.

The 4.15 metre height limitation comes from section 4 of the *Commercial Vehicle Dimension and Weight Regulation* (AR 315/2002) under the *Traffic Safety Act*. Vehicles and their loads must not exceed this height when operating on a highway unless Alberta Transportation has granted a special permit to do so.

For more information:

The *Commercial Vehicle Dimension and Weight Regulation* can be found at the following Internet address:

 www.qp.alberta.ca/570.cfm

The safe limit of approach distances do not apply because the clearance distance does not vary during transportation and "work" is not being performed. The distances always apply when loads and equipment are moved about on a work site when "work" is being done. Examples include a dump truck loading or unloading gravel, a mobile crane moving from one location to another at a work site, a rolling scaffold being repositioned.

Overhead power lines are installed at heights that allow equipment, buildings, or objects to be safely moved beneath them. The safe installation height varies depending on the location of the power line as shown in Table 17.2. These values are set by Rule 2-016(1) of the *Electrical Communication and Utility Code (ECUC)*, 2nd Edition, 2002.

Table 17.2 Minimum height above ground of overhead power lines

Location of overhead power line	Height above ground
Areas normally accessible to pedestrians only	3.6 m
Driveways to residences or residential garages	4.1 m
Areas where agricultural equipment is normally used	4.2 m
Lanes, alleys or entrances to commercial or industrial premises	4.8 m
Roads and highways	5.3 m
Right-of-way of underground pipelines	5.4 m

According to Rule 2-016(2) of the ECUC, equipment, a building, or an object exceeding the heights listed in Table 17.2 must not be moved under an overhead power line until the operator of the overhead power line is contacted and takes whatever steps are necessary to protect workers and the power line. The power line operator must be contacted before the move begins and the operator is required to provide assistance as soon as possible.

Some employers routinely (and perhaps on very short notice) move equipment, buildings, or objects exceeding the heights listed in Table 17.2. These employers may find it difficult to comply with Rule 2-016(2). It is suggested that the employer and the power line operator(s) work together to develop processes that anticipate such difficulties and ensure that the move is done safely.

Section 227 Utility worker and tree trimmer exemption

This section recognizes that section 225 does not apply to electric utility workers, qualified electric utility workers or electric utility tree trimmers to whom other distances apply. The Electrical and Communication Utility Code (ECUC) defines these workers as follows:

“electric utility worker” means

- (a) a worker trained to recognize hazards associated with energized electrical equipment or lines and trained and experienced to work safely near energized electrical equipment or lines in accordance with the requirements of [the Electrical and Communication Utility Code] while performing duties assigned by an employer; and
- (b) a worker trained and experienced to work safely on energized electrical equipment or lines operating at voltages below 750 V between conductors in accordance with the requirements of [the Electrical and Communication Utility Code] while performing duties assigned by an employer.

“electric utility tree trimmer” means a worker certified by the Industrial Vegetation Management Association of Alberta, or other acceptable agency, to remove trees or portions of trees near power lines or other electrical equipment including aerial trimming in accordance with the requirements of [the Electrical and Communication Utility Code].

“qualified electric utility worker” means a power line or station electric utility worker trained and experienced to work safely on energized electrical equipment or lines in accordance with the requirements of [the Electrical and Communication Utility Code] while performing duties assigned by the employer.

These workers are specially trained and qualified to perform work near energized overhead power lines. These workers must comply with different safe limit of approach distances specified in the *Electrical and Communication Utility Code*.

Overview

Contacts with energized overhead power lines are a common occurrence in Alberta. In the 12-month period ending March 31, 2003, 369 contacts with overhead power lines were reported to Alberta Municipal Affairs. An additional 68 contacts with underground power lines were reported in the same time period. The 437 contacts are believed to represent just a small fraction of the total number of annual power line contacts — most go unreported.

Regulations under the *Safety Codes Act* require all electrical accidents and power line contacts to be reported to Alberta Municipal Affairs, Safety Services. The telephone number of the Safety Services office to which reports should be made is (780) 427-8256. The e-mail address for Safety Services is safety.services@gov.ab.ca. An on-line Incident Occurrence Form is also available and can be found at:

 www.municipalaffairs.gov.ab.ca/ss/STANDATA/electrical/IncidentOccurrenceReportForm.pdf

If a power line contact occurs at a mine or mine site, the Director of Inspection having responsibility for mines must also be notified. This is required by section 544 of the OHS Code.

Table 17.3 presents historical power line contact data for the 15-year period ending December 31, 2007. Table 17.4 lists the type of contact or damage associated with the contacts that occurred in the 12-month period ending December 31, 2007. Table 17.5 summarizes power line fatality information for the 15-year period ending December 31, 2007. Complete summary reports for other time periods and years can be found at:

 [www.municipalaffairs.gov.ab.caam Electrical Incident Statistics Report.cfm](http://www.municipalaffairs.gov.ab.caam/Electrical%20Incident%20Statistics%20Report.cfm)

Precautions to take when working near overhead lines

The following is a list of suggested practices that should be followed when working near overhead power lines.

- (1) Equipment operators and users must respect the safe limit of approach distances specified in section 225 of the OHS Code.
- (2) A competent signaller as described in section 191 of the OHS Code should be used. The signaller's only responsibility is to make sure that the equipment operator does not get closer than the safe limit of approach distance.
- (3) No one should be allowed to touch the load or any part of the equipment until the signaller indicates it is safe to do so.
- (4) Other workers not directly involved in the work being performed should be kept away from equipment when it is being used near overhead power lines.
- (5) Equipment operators must always be aware of the position of their equipment in relation to overhead power lines. They should not depend on safety devices such as hook insulators, insulating blankets, etc.
- (6) Equipment operators should be aware that a long span of power line can rise and fall as the ambient temperature changes, affecting safe limit of approach distances. Wind-induced swing can also affect these distances.
- (7) Grounding equipment in the area of the power line is not a safe practice.
- (8) The route that a crane or similar equipment will follow should be marked out

before it is moved. Uneven terrain can cause the boom or other structure to weave or bob, increasing the likelihood of power line contact.

- (9) When using tag lines to control an elevated load, the tag lines should be made of a non-conducting material such as dry rope.

Table 17.3 Historical summary of reported power line contacts in Alberta

	92/93	93/94	94/95	95/96	96/97	97/98	98/99	2000	2001	2002	2003	2004
Overhead contacts	414	457	430	265	371	477	349	230	386	346	390	471
Underground contacts	102	95	65	45	133	122	86	52	66	54	78	79
Total	516	552	495	310	504	599	435	282	452	400	468	550

	2005	2006	2007
Overhead contacts	368	353	264
Underground contacts	70	63	80
Total	418	416	344

Source: Alberta Municipal Affairs, Safety Services

Table 17.4 Type of contact or damage associated with overhead power line contacts that occurred in the 12-month period ending December 31, 2007.

Type of contact or damage	Number of line contacts
Vehicle-mounted equipment (booms, hoists, cranes, etc)	29
Trucks with raised boxes and vehicles transporting high loads	65
Excavating or earth moving vehicles	53
Farm implements	38
Relocating structures (grain bins)	2
Vehicles out of control	50
Aircraft, parachutes, kites, etc.	4
Falling, brushing or trimming trees	
(a) Utility tree trimmers/workers	3
(b) Others	16
Drilling and seismic equipment	0
Other inadvertent contacts	4
TOTAL	264

Source: Alberta Municipal Affairs, Safety Services

Table 17.5 Historical summary of fatalities associated with power line contacts in Alberta

	92/93	93/94	94/95	95/96	96/97	97/98	98/99	2000	2001	2002	2003
Due to contact with overhead power line	4	3	0	0	1	7	1	1	1	1	1
Due to contact with underground power line	0	0	0	0	0	0	0	0	0	0	0
Total	4	3	0	0	1	7	1	1	1	1	1

	2004	2005	2006	2007
Due to contact with overhead power line	1	1	1	1
Due to contact with underground power line	0	0	0	0
Total	1	1	1	1

Source: Alberta Municipal Affairs, Safety Services