



Dora

Department of Regulatory Agencies

Division of Registrations



COLORADO PASSENGER TRAMWAY SAFETY BOARD RULES AND REGULATIONS



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TABLE OF CONTENTS
Colorado Passenger Tramway Safety Board
Rules and Regulations Booklet

<u>Section</u>	<u>Subject</u>	<u>Page</u>
	Forward	3
	Preamble and incorporation by reference	4
1.	General requirements	1-1
2.	Aerial tramways	2-1
3.	Detachable grip aerial lifts	3-1
4.	Fixed grip aerial lifts	4-1
5.	Surface lifts	5-1
6.	Tows	6-1
7.	Conveyors	7-1
8.	Reserved	7-2
9.	Funicular	9-1
10.	Reserved	9-1
11.	Reserved	9-1
12.	Reserved	9-1
13.	Reserved	9-1
14.	Reserved	9-1
15.	Reserved	9-1
16.	Reserved	9-1
17.	Reserved	9-1
18.	Reserved	9-1
19.	Reserved	9-1
20.	Tramway licensing	20-1
21.	New installations and modifications	21-1
22.	Inspections	22-1
23.	Passenger tramway incidents	23-1
24.	Rule of board procedure	24-1

Annexes

<u>Annex</u>	<u>Subject</u>	<u>Page</u>
Annex E.	Operator control devices	Annex E-1
Annex F.	Combustion engine(s) and fuel handling	Annex F-1
Annex G.	Welded link chain	Annex G-1

Appendixes

<u>Section</u>	<u>Subject</u>	<u>Page</u>
A.	List of sections affected	A-1
B.	Policy statements	B-1
C.	Colorado Revised Statutes 25-5-701 through 25-5-721	C-1

FOREWORD

This booklet contains rules, statutes, and policies which pertain to the licensure of passenger tramways in Colorado. Passenger tramways must be licensed annually by the Colorado Passenger Tramway Safety Board before they can lawfully operate in Colorado. The Board has established standards of design and operation practices for all recreational tramways, and requires inspections of each device at least twice annually.

Colorado Revised Statutes Title 25, Article 5, Part 7 is the legal authority for the Board and is the basis for all Board activities. This statute is located at the end of this booklet.

The Board's rules and regulations are comprised of two documents: the "American National Standard for Passenger Tramways - Aerial Tramways, Aerial Lifts, Surface Lifts, Tows and Conveyors - Safety Requirements" and the "American National Standard for Funiculars - Safety Requirements" known simply as "ANSI", and the Colorado Rules and Regulations.

The ANSI documents are available for review at the Board's office during normal working hours or can be obtained by contacting the National Ski Areas Association at 303/987-1111.

The Colorado Rules and Regulations that contain technical rules not found in ANSI, ANSI rules which have been revised by the Board, and the Board's administrative rules are found in this booklet. Revision of these rules is an ongoing process. You will be notified when any rules are added, deleted, or revised by the Board.

Also included in this booklet are general policies adopted by the Board and a list of rules, which have been revised, added, or deleted since the last publication.

You are encouraged to contact the Colorado Passenger Tramway Safety Board at 303/894-7785 if you have any questions regarding the contents of this booklet.

Rule 0.1 Preamble and incorporation by reference. Section 25-5-704(1)(a) of the Colorado Revised Statutes allows the Colorado Passenger Tramway Safety Board (“Board”) to “use as general guidelines the standards contained in the 'American Standard Safety Code for Aerial Passenger Tramways', as adopted by the American Standards Association, Incorporated, as amended from time to time.” Since 1965, when this provision was enacted, the American Standards Association, Inc., has been succeeded by the American National Standards Institute, Inc. and the American Standard Safety Code updated. The relevant publications are now known as the “American National Standard for Passenger Ropeways – Aerial Tramways, Aerial Lifts, Surface Lifts, Tows and Conveyors – Safety Requirements” (“ANSI B77.1-2006”)–and the “American National Standard for Funiculars – Safety Requirements” (“ANSI B77.2-2004”).

The Board adopts and incorporates by reference, with certain additions, revisions, and deletions, the ANSI standards as listed below:

B77.1-1960	June 8, 1960	USA standard Safety Code for Aerial Passenger Tramways
B77.1a-1963	July 1, 1963	Addenda to USA standard Safety Code for Aerial Passenger Tramways
B77.1b-1965	July 26, 1965	Addenda to USA standard Safety Code for Aerial Passenger Tramways
B77.1-1970	March 17, 1970	American National Standard - Safety Requirements for Aerial Passenger Tramways
B77.1-1973	January 25, 1973	American National Standard - Safety Requirements for Aerial Passenger Tramways
B77.1-1976	November 19, 1975	American National Standard - Safety Requirements for Aerial Passenger Tramways
B77.1a-1978	January 17, 1978	Addendum to American National Standard - Safety Requirements for Aerial Passenger Tramways
B77.1-1982	July 16, 1982	American National Standard - for passenger tramways - aerial tramways and lifts, surface lifts and tows – Safety Requirements
B77.1a-1986	December 2, 1985	Supplement to American National Standard - for passenger tramways - aerial tramways and lifts, surface lifts and tows - Safety Requirements
B77.1b-1988	March 14, 1988	Supplement to American National Standard - for passenger tramways - aerial tramways and lifts, surface lifts and tows – Safety Requirements
B77.1-1990	March 26, 1990	American National Standard for Passenger Tramways - Aerial Tramways and Lifts, Surface Lifts and Tows - Safety Requirements
B77.1-1992	December 2, 1992	American National Standard for Passenger Tramways - Aerial Tramways, Aerial Lifts, Surface Lifts, Tows - Safety Requirements

B77.1-1999	March 11, 1999	American National Standard for Passenger Ropeways - Aerial Tramways, Aerial Lifts, Surface Lifts, Tows and Conveyors - Safety Requirements
B77.2-2004	December 31, 2003	American National Standard for Funiculars- Safety Requirements Aerial Tramways, Aerial Lifts, Surface Lifts, Tows and Conveyors - Safety Requirements
B77.1-2006	April 17, 2006	American National Standard for Passenger Ropeways - Aerial Tramways, Aerial Lifts, Surface Lifts, Tows and Conveyors - Safety Requirements

As used in this document, the term “rules and regulations” means the referenced ANSI Standards and the “State of Colorado Department of Regulatory Agencies Passenger Tramway Safety Board Rules and Regulations.” The Board Rules and Regulations do not include any later amendments to or editions of the standards listed above.

A copy of each of the standards, codes, and guidelines listed above are available for public inspection at the Board office at the Division of Registrations, Department of Regulatory Agencies, 1560 Broadway, Suite 1350, Denver, Colorado, 80202, and at any state publications depository library. For further information regarding how this material can be obtained or examined, contact the Board's Program Director at 1560 Broadway, Suite 1350, Denver, Colorado, 80202, (303) 894-7785.

Section 1 General requirements

1.1 Scope. This document establishes a standard for the design, manufacture, construction, operation and maintenance of the passenger tramways in the State of Colorado. For this standard, passenger tramways include:

- (1) Aerial tramways (single and double reversible);
- (2) Aerial lifts (detachable lifts, chair lifts, and similar equipment);
- (3) Surface lifts (T-bar lifts, J-bar lifts, platter lifts, and similar equipment);
- (4) Tows (wire and fiber rope tows);
- (5) Funiculars;
- (6) Conveyor lifts.

These rules and regulations are promulgated by the Colorado Passenger Tramway Safety Board pursuant to the authority conferred by C.R.S. 25-5-701 et. seq., as amended.

1.2 Purpose. The purpose of this standard is to develop a system of principles, specifications, and performance criteria that will meet the following objective:

- (1) Reflect the current state of the art of tramway design, operation, maintenance, and construction.

It is recognized that certain dangers and risks are inherent in machines of this type and their operation. It is also recognized that inherent and other risks or dangers exist for those who are in the process of approaching, loading, unloading, and departing from passenger tramways. This system is intended to result in tramways that are designed, constructed, operated, and maintained in a manner that helps reduce danger and exposure to risk to passengers and maintenance and operational personnel and to encourage improvements in productivity, efficiency, development, and progress consistent with the objective.

Such a system with this stated objective constitutes a safety standard.

1.2.3 Exceptions. Strict application of the provisions of this standard may not be appropriate in every instance. Wherever it may be proposed to depart from the provisions of this standard, the authority having jurisdiction may grant exceptions from the literal requirements or permit the use of other devices or methods that provide features comparable to those included in this standard, providing that after receiving such evidence as the Board may require, the Board determines that:

- (a) The granting of such an exception would be consistent with, and would aid in, implementing the legislative policy set forth in C.R.S. 25-5-701; and either,
- (b) Compliance with applicable rules and regulations from which an exception is sought would create an unreasonable operational or design condition; or
- (c) Compliance with applicable rules and regulations from which an exception is sought would create an unreasonable economic burden.

1.2.4.1 Existing installations. Existing tramways, when reinstalled, shall be classified as new installations (see 1.2.4.2). For tramways that have not been relocated, but have not had routine maintenance performed within the previous two years or longer, these tramways shall be subject to an acceptance test as outlined in 2.1.1.11, 3.1.1.11, 4.1.1.11, 5.1.1.11, 6.1.1.11, 7.1.1.11 (ANSI B77.1-2006) and 2.1.1.11 (ANSI B77.2-2004) Acceptance Test. This test and inspection shall verify that the tramway is in compliance with the rules and regulations that were in effect at the time the tramway was originally constructed and current rules that affect all tramways. A tramway modification or alteration shall be defined by 21.1 and meet the requirements of 21.3, 21.4, and 21.5.

If an ANSI B77.1 or CPTSB rule was in existence at the time of the ropeway installation date or modification date of an existing tramway and is absent from the current CPTSB rules and regulations, it shall continue to be required.

1.2.4.2 New installations. New installations which have not received their initial registration by the effective date of these rules and regulations shall meet the requirements in effect at the time of initial registration.

1.2.4.3 Major tramway modification. A major tramway modification shall be defined as an alteration of the current design of the tramway which results in:

- (a) A change in the design speed of the system;
- (b) A change in the rated capacity by changing the number of carriers, spacing of carriers, or load capacity of carriers;
- (c) A change in the path of the rope;
- (d) Any change in the type of brakes and/or backstop devices or components thereof;
- (e) A change in the structural arrangements;
- (f) A change in power or type of prime mover or auxiliary engine;
- (g) A change to control system logic.

1.2.5 Interpretation of rules and regulations. Additional explanation or interpretation of these rules and regulations shall be the responsibility and at the reasonable discretion of the Board. An appeal to the ruling of the Board may be made in conformance with C.R.S. 24-4-106.

1.2.6 Existing laws or ordinances. This standard shall be considered as supplementary to any existing law or ordinance covering the installation or operation of these facilities. All construction shall be in accordance with applicable codes of the state or its political subdivisions and the codes and standards of the industry.

1.4 Definitions.

authority having jurisdiction: The Colorado Passenger Tramway Safety Board is the authority having jurisdiction over passenger tramway facilities in the State of Colorado. Other public or private bodies may exercise a concurrent jurisdiction over a particular installation by virtue of location or other interests. No such joint jurisdiction shall be limited by these rules and regulations; neither shall these requirements be mitigated by others without the concurrence of the Board.

critical components: Critical components are those parts of a tramway or lift system, the failure of which is likely to cause serious injury to the passengers. The list of critical components for a tramway or lift system shall include, but not be limited to the following:

- (1) Carrier, including grip, hanger, chair, or gondola;
- (2) Haul rope sheaves, sheave units and their attachments;
- (3) Terminal sheaves and their attachments;
- (4) Tension systems and their attachments;
- (5) Wire rope, including haul ropes, track ropes and counterweight ropes.

design integrity: Verification of design integrity means verification that the tramway conforms to the original design accepted by the Board and such modifications as have been authorized by the Board.

Qualified Engineer: An engineer who is registered as a Professional Engineer in the State of Colorado.

safety gate: See Stop Gate.

stop gate: A stop gate is a type of automatic stopping device that, when actuated by a passenger's weight, contact, or passage, will automatically stop the tramway. For the purposes of complying with these rules and regulations, stop gate and safety gate shall be considered to have the same meaning.

1.5 Quality assurance programs. Critical components shall be designed, manufactured, installed, and operated in accordance with a quality assurance program. A quality assurance program shall be one that assures that the critical components comply with applicable standards, specifications, and requirements of the authority having jurisdiction.

The program for the design of these components shall verify and document the use of properly selected load factors or allowable stresses based on the conditions of loading and design life. The program shall also verify and document the use of analysis, calculations, and checking procedures.

The program for the manufacture of these components shall verify and document that fabricated and supplied parts conform to the design plans and specifications.

The program for the installation of these components shall verify and document that the installed parts conform to the design plans and specifications.

For the area operator, as defined in C.R.S. 25-5-702(1), the program shall verify and document that the in-use periodic testing requirements of the designer and manufacturer are completed by qualified personnel.

This rule shall apply to all critical components manufactured and installed after January 1, 1992.

Section 2 Aerial Tramways

Note: Timeframes relate to the ropeway installation date or modification date whichever controls, unless otherwise noted.

2.1.1.3.1 Location of power lines. Power lines shall be located a minimum distance equal to the height of poles or support structures from any passenger tramway so that poles and electrical lines cannot touch any portion of the tramway, loading or unloading points or platforms and tow path, if applicable, upon collapse of poles or lines, unless suitable and approved precautions are taken to safeguard human lives.

2.1.1.3.2 Air space requirements.

2.1.1.3.2.1 Structures.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by vertical planes commencing at a point thirty-five (35) feet from the intersection of the vertical planes of the ropes or cables and ground surface.

For purposes of this rule, buildings controlled by the licensee used primarily for maintenance and operation of the lift and other tramways shall not be considered structures; however, buildings must comply with the following.

- (1) No flammable liquids may be stored in the building outside of a UL listed container or storage cabinet, unless such flammable liquids are in the original containers and intended for daily usage. Quantities must be consistent with normal daily use. Class I or II flammable storage materials shall be limited to 2 gallons in a UL listed container and must be stored either in an outside storage area or in a UL listed cabinet.
- (2) The building must be within the view of the attendant but not impair the sight line of the lift.
- (3) Entrances to all machinery, operators', and attendants' rooms shall be locked when not in use. Unattended entrances accessible to public, which may be left open, shall be equipped with barriers to prevent entry.

2.1.1.3.2.2 Cables or ropes.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

Any cable or rope installed on or near a ropeway that may represent a hazard to the ropeway shall be monitored to automatically stop the ropeway if the cable or rope fails. Failure would be defined as per Section 23.1 (g).

EXCEPTION: Track or haul ropes are excluded from this rule.

2.1.1.12 Safety of operating and maintenance personnel.

Provision shall be incorporated in the aerial tramway design to render the system inoperable when necessary for the protection of personnel working on the aerial tramway. See 2.3.1.1 for placement of applicable warning signs.

The aerial tramway shall incorporate an audible warning device that signals of an impending start of the ropeway. After the start button is pressed, the device shall sound an audible alarm for a minimum of 2 seconds and shall continue until the ropeway begins to move. The audible device shall be heard inside and outside all terminals and machine rooms above the ambient noise level.

2.1.2.1.1 Auxiliary power unit.

An auxiliary power unit (APU) with an independent power source shall be provided to move the carrier(s) to a terminal in the event of failure of the primary power unit.

A single auxiliary power unit shall not be used except to unload passengers and for maintenance purposes. This unit shall be electrically wired to meet the requirements of 2.2.1.7.2 so that it can be stopped by the Emergency Shutdown Circuit. The auxiliary power unit shall not depend upon the mechanical integrity of the prime mover to drive the unit. The prime mover shall be disconnectable in event of a mechanical lockup.

The auxiliary power unit shall be designed to become operational and move the carriers to terminal areas within 1 hour from the time of initiating its connection.

2.1.2.5 Brakes.

The aerial tramways shall have the following friction-type brakes:

- service brake (see 2.1.2.5.1);
- drive sheave brake (see 2.1.2.5.2);
- track cable brake (see 2.1.4.3.2).

All drive braking systems shall be designed and monitored to ensure that:

- a) once the aerial tramway begins movement in the intended direction, the brakes are maintained in the open position;
- b) the service brake shall not open prior to the drive system developing torque;
- c) multiple brakes or brake systems shall not be simultaneously applied such that excessive deceleration is applied to the aerial tramway under any condition of loading;
- d) the failure of one braking system to properly decelerate the aerial tramway shall automatically initiate a second braking system, if any.

The service brake and drive sheave brake shall be designed such that failure of one braking system shall not impair the function of the other systems, and all brakes shall have the braking force applied by springs, weights, or other approved forms of stored energy.

The service brake and drive sheave brake shall be designed to assure operation under all anticipated conditions.

Deceleration rates specified in 2.1.2.4 shall be achieved by each brake without the aid of other braking devices or drive regeneration.

All drive braking systems shall be capable of operation to comply with the daily inspections and periodic testing.

A qualified engineer shall furnish a written procedure to be followed and specify the auxiliary equipment necessary for periodic testing and adjustment of the holding force of each brake. This procedure shall be performed during the acceptance test, and at the frequency specified, to demonstrate the ability of each brake to produce the required torque.

Such testing shall be accomplished as part of normal maintenance during the operating season, but shall be performed when the aerial tramway is not open to the public.

2.1.2.5.1 Service brake.

The service brake can be located at any point in the drive train such that there is no belt, friction clutch, or similar friction-type device between the brake and the drive sheave.

The service brake shall be an automatic brake to stop and hold the aerial tramway under the most unfavorable design loading condition. The rate of application of this brake shall be adjustable. This brake shall have the design capability to decelerate the aerial tramway at a rate of 2 feet (0.6 meter) per second squared when operating under the most unfavorable condition of overhauling load and at full speed.

2.1.2.5.2 Drive sheave brake.

Drive sheave brake controls shall be located and the brake activated in a manner that deceleration will begin within 3 seconds after the operator or attendant reacts to the stimulus to apply the brake.

The drive sheave brake shall operate on the drive sheave assembly.

Application of the drive sheave brake shall automatically disconnect the power source to the power unit in use. This brake shall act automatically when the speed of the haul rope exceeds the design speed by 15% in either direction or if the carriers travel beyond their normal stopping position in either terminal.

The drive sheave brake shall be an automatic brake to stop and hold the aerial tramway under the most unfavorable design loading condition. The rate of application of this brake shall be adjustable. This brake shall have the design capability to decelerate the aerial tramway operating at full speed, with the design loading condition most unfavorable to stopping, at 1.5 feet (0.5 meter) per second squared and within the parameters specified in 2.1.2.4.

2.1.2.6.1 General.

Moving machine parts that normally may be in reach of personnel shall be fitted with guards conforming to *American National Standard Safety standard for mechanical power transmission apparatus*, ANSI/ASME B15.1-1992.

Protection against static electricity shall be provided.

Fire-fighting device(s) shall be available.

2.1.2.7.4 Egress. Permanent stairs and walkways shall be provided for egress from all machinery areas. The maximum angle of inclination for the stairs shall not exceed 70 degrees. Stairs and walkways shall have a minimum width of 18 inches. Stair treads shall have a minimum depth of 4 inches. Walkway surfaces and stair treads shall be constructed of non-skid bar grating or expanded metal. Handrails shall be provided.

2.1.2.11 Manual and automatic control devices.

All control devices and switches shall conform to the requirements of 2.2.1.7.

2.1.2.11.1 Manual control devices.

The following manual control devices that will initiate a stop shall be installed and conspicuously and permanently marked:

- a) a stop device at each terminal platform;

- b) a stop device on the conductor's control console in each carrier when a conductor is required in the carrier;
- c) a stop device at the operator's station;
- d) emergency shutdown device (see 2.1.5 and 2.2.1.7.2).

2.1.2.11.2 Provisions for automatic stop devices.

The following automatic stop devices or systems shall be installed:

- a) a device(s) that will be actuated in the event manual or automatic controls fail to reduce aerial tramway speeds to design values at critical control points along the line;
- b) a device(s) that will stop the aerial tramway before the carrier reaches its limit of travel. An adequate bumper system shall also be installed;
- c) a device(s) that will stop the aerial tramway before any counterweight, other tension system device, or tension sheave carriage reaches either end of its travel, or when the tension system exceeds its range of normal operating travel. When pneumatic or hydraulic tension systems are used, pressure-sensing devices shall also be incorporated that will stop the aerial tramway system in case the operating pressure goes above/below the design pressure range. Such pressure-sensing devices shall be located close to the actual tensioning device. It shall not be possible to isolate the pressure sensor from the actual tensioning device;
- d) a device that will be actuated by the application of a track cable brake. These devices shall effect an emergency shutdown;
- e) a device that will stop the aerial tramway in the event a cabin door is not closed;
- f) a mechanical overspeed device mounted on the driving sheave shall effect an emergency shutdown in the event of a 15% overspeed;
- g) a device that will effect a stop of the aerial tramway in the event of inadvertent actuation of the brake system(s);
- h) a device that will stop the aerial tramway in the event that the haul rope comes in contact with the track cable or other grounded equipment (bicable systems only).

2.1.3.3.2 Sheave and sheave unit design.

Sheave flanges shall be as deep as possible, considering other features of the system. At the same time, rope attachments shall be designed in relation to the sheave groove so as not to contact sheave flanges during normal operations, taking into consideration the anticipated amount of wear of the sheave liner groove. Attachments shall be allowed to contact sheave flanges adjacent to the haul rope when the carrier swings, provided that this is considered in the design of the attachments and sheaves. Furthermore, rope attachments, sheave flanges, and hanger guides shall be designed so that hangers cannot be caught behind guides, and so that ropes and attachments cannot be deroped from sheaves if the carrier is swinging within design limits as it approaches or passes the tower.

Suitable guards, of sufficient strength to resist the lateral forces caused by an inside deropement, shall be installed.

Construction of the entire sheave unit shall be such that the rope cannot become entangled in the sheave unit in the event the rope leaves the sheave toward the outside.

On each sheave unit, rope-catching devices shall be installed to reduce the risk of the rope moving excessively in the direction of the load on the sheave unit in the event of deropement. These devices shall be located less than one-half the diameter of the sheaves from the normal operating position of the rope and shall extend a minimum of two rope diameters beyond the sheave flange. They shall be designed to permit the passage of the rope and attachments after deropement.

On each sheave unit, suitable devices shall be installed and maintained that will stop the aerial tramway in case of deropement (see 2.1.2.11.2(h)).

If the gage of the haul rope system is varied at any point along the line, the horizontal departure at any one tower shall be provided for in the design so that deropement cannot occur by virtue of such a departure.

Sheave mounts or mounting frames shall be designed to be adjustable, allowing the sheave units to be aligned and held in the plane of the rope.

See also 2.1.1.4 through 2.1.1.4.7 for the effect of tower height and location on sheave units.

2.1.5 Provisions for operating personnel.

Operator and attendant stations shall be located to provide visual surveillance of the station and the line in the vicinity of the station or in a cabin. When enclosed, they shall be heated, ventilated, and lighted as required to perform the function of the station. They shall contain, inside the station when enclosed:

- a) the communications and controls required of the station;
- b) the operating instructions and emergency procedures;
- c) a fire extinguisher.

This does not preclude additional communications and controls located outside the enclosed station. All enclosed stations shall be locked to prevent unauthorized entry when unattended.

The operator shall be located where he/she can observe the aerial tramway in operation and may be located in a cabin. The physical appearance, operation, and location of emergency shutdown devices shall differentiate them from other operating devices or controls. The operator's controls and communicating devices shall be within reach without leaving his/her position.

2.1.6.1 Operational manual.

The designer of each new or reinstalled aerial tramway shall prepare an operational manual for use with each installation. The manual shall describe the function and operation of the components and provide instructions for the correct usage of the installation.

2.2.1.3 Protection.

All transformer stations and other high voltage electrical equipment shall be marked with conspicuous warning signs and shall be protected so as to prevent unauthorized persons from entering the area or coming in contact with any portion of the equipment or wiring. All power equipment shall be protected against overloads by circuit breakers or fuses.

2.2.1.4 Voltage limitations for overhead circuits.

Signal, communication, and control circuits may be supported between towers that support the aerial tramway. Voltage on overhead or exposed circuits shall be limited to 50 volts with the exception of the intermittent ring-

down circuits for telephone systems.

2.2.1.7 Operating control circuits.

2.2.1.7.1 Operating circuits.

All aerial tramway systems shall contain one or more normally de-energized circuit(s) that, when energized, allow(s) the system to start, accelerate to and run at designated speeds, and when interrupted or de-energized by manual stop switches, automatic stop devices, inadvertent ground or a power failure, cause(s) the system to stop.

Operating circuits shall not have anything across or parallel with the contacts of switches, relays, or automatic stopping devices (including solid state devices monitoring the circuits or devices), unless it can be shown that any failure mode of the device placed across the contacts does not defeat the purpose of the operating circuit devices.

All start/run/stop and speed control switches shall be conspicuously and permanently marked with the proper function.

All automatic and manual stop and shutdown devices shall be of the manually reset type. An exception to this requirement is allowed for magnetic or optically operated automatic stop devices, if the operating circuit is such that it indicates that such devices initiated the stop and the circuit is of the manually reset type.

Manual stop switches (push button) shall be positively opened mechanically and their opening shall not be dependent upon springs.

2.2.1.7.2 Emergency shutdown circuit.

All aerial tramway systems shall include a normally de-energized circuit that, when energized, allows the system to run and when interrupted, effects a shutdown (see 1.4.22). The shutdown shall have priority over all other control stops or commands. If, for any reason, the operator has lost control of the aerial tramway while using the operating control circuitry, the controls shall include an emergency shutdown circuit allowing the operator/attendant to stop the aerial tramway. Any one of the following conditions is considered a loss of control of an aerial tramway:

- a) Aerial tramway will not SLOW DOWN when given the command to do so;
- b) Aerial tramway will not STOP when given the command to do so;
- c) Aerial tramway OVERSPEEDS beyond control settings and/or maximum design speed;
- d) Aerial tramway ACCELERATES faster than normal design acceleration;
- e) Aerial tramway SELF-STARTS or SELF-ACCELERATES without the command to do so;
- f) Aerial tramway REVERSES direction unintentionally and without the command to do so.

The shutdown circuit shall not have anything across or parallel with the contacts of switches, relays, or other devices in this circuit, but can have such devices as solid state monitoring devices and microprocessors in series with the manual shutdown device and main control contactor (main control disconnect coil).

This circuit shall include a manual shutdown device at each station and in the machine room. The shutdown device shall be conspicuously and permanently marked and shall be red in color (see 2.1.5).

2.2.1.7.3 Bypass circuits.

A temporary bypass circuit may be installed for malfunctions in operating control circuitry (see 2.3.2.5.9).

2.3.1.3 Operational plan for transportation of recreational equipment. Each licensee shall have an operational plan that has procedures for transportation of sports equipment and recreational devices by foot passengers. This plan shall be consistent with the tramway manufacturer's specifications and instructions, if any.

Section 3 Detachable grip aerial lifts

Note: Timeframes relate to the ropeway installation date or modification date whichever controls, unless otherwise noted.

3.1.1.3.1 Location of power lines.

Jan, 1, 1977 to Present:

Power lines shall be located a minimum distance equal to the height of poles or support structures from any passenger tramway so that poles and electrical lines cannot touch any portion of the tramway, loading or unloading points or platforms and tow path, if applicable, upon collapse of poles or lines, unless suitable and approved precautions are taken to safeguard human lives.

3.1.1.3.2 Air space requirements.

3.1.1.3.2.1 Structures.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

May 15, 2000 to Present:

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by vertical planes commencing at a point thirty-five (35) feet from the intersection of the vertical planes of the ropes or cables and ground surface.

For purposes of this rule, buildings controlled by the licensee used primarily for maintenance and operation of the lift and other tramways shall not be considered structures; however, buildings must comply with the following.

- (1) No flammable liquids may be stored in the building outside of a UL listed container or storage cabinet, unless such flammable liquids are in the original containers and intended for daily usage. Quantities must be consistent with normal daily use. Class I or II flammable storage materials shall be limited to 2 gallons in a UL listed container and must be stored either in an outside storage area or in a UL listed cabinet.
- (2) The building must be within the view of the attendant but not impair the sight line of the lift.
- (3) Entrances to all machinery, operators', and attendants' rooms shall be locked when not in use. Unattended entrances accessible to public, which may be left open, shall be equipped with barriers to prevent entry.

Jan. 1, 1994 to May 15, 2000:

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by planes having an outward slope of one horizontal and two vertical and commencing at a point twenty (20) feet horizontally outside of the intersection of the vertical planes of ropes or cables and ground surface

Dec. 30, 1977 to Jan. 1, 1994:

No passenger tramway installation shall be permitted whenever the Passenger Tramway Operator does not have permanent and irrevocable control of the following air space (except when the passenger tramway is located on Forest Service land): the area bounded by planes having an outward slope of one horizontal and two vertical and commencing at a point twenty (20) feet horizontally outside of the intersection of the vertical planes of ropes or cables and ground surface

Prior to Dec. 30, 1977:
None required

3.1.1.3.2.2 Cables or ropes.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

May 15, 2000 to Present:

Any cable or rope installed on or near a ropeway that may represent a hazard to the ropeway shall be monitored to automatically stop the ropeway if the cable or rope fails. Failure would be defined as per Section 23.1 (g).

EXCEPTION: Track or haul ropes are excluded from this rule.

Prior to May, 15, 2000:
Not required

3.1.1.5.2 Clearances.

Jan, 1, 1984 to Nov. 1, 1991:

Terminals and towers shall be designed and installed to provide the clearances as herein specified and to minimize surge of the line under operating conditions. Local wind conditions shall be taken into consideration.

The minimum distance between passing carriers, each swung 10 degrees inward from the vertical, shall be the greater of the following:

- a) 2 feet 6 inches
- b) 1/2% of the span length (applies to gondolas only).

The distance between haul ropes, (or track cables), for the purpose of these checks, shall be considered as equal to the gauge of the line.

External structures, posts, or obstructions, other than lift structural components, shall have at least 4 feet (1.22 meters) of clearance from either edge of a loaded open carrier passenger seat or open cabin body (measured from the outermost attachments on or parts of the carrier while the carrier is hanging in a vertical position).

Prior to Jan. 1, 1984:

Terminals and towers shall be designed and installed to provide the clearances as herein specified and to minimize surge of the line under operating conditions. Local wind conditions shall be taken into consideration.

The minimum distance between passing carriers, each swung 10 degrees inward from the vertical, shall be the greater of the following:

- a) 2 feet 6 inches
- b) 1/2% of the span length (applies to gondolas only).

The distance between haul ropes, (or track cables), for the purpose of these checks, shall be considered as equal to the gauge of the line.

3.1.1.5.3 Terminal clearances.

Prior to Nov. 1, 1991:
Not required.

3.1.2.1.3 Power unit interlock.

Prior to May 15, 2006:

Not required.

3.1.2.5 Stops and shutdowns.

For all stops, the minimum average rate of the carrier's horizontal deceleration shall be adequate to prevent carrier collision in the receiving and launching mechanisms.

The maximum rate of the rope deceleration shall be 5 feet per second squared (1.52 meters per second squared). These measurements shall be measured over any one second interval under any operating condition while the carrier is attached to the haul rope and referenced to the rope speed at the drive terminal.

Normal stop: (see 1.4 – *normal stop*). If a service brake is required (see table 3-1), it shall have been applied by the time the aerial lift comes to a stop.

Emergency shutdown: (see 1.4 – *emergency shutdown*) The drive sheave brake shall be applied. The service brake, if installed, shall have been applied by the time the aerial lift comes to a stop. The designer shall designate which control functions of the ropeway system shall initiate an emergency shutdown.

The designer may define other stopping modes other than normal and emergency shutdown. For other stopping modes, the designer shall specify the method of stopping, including the type and timing of brake(s) that may be applied, and the stopping criteria.

Table 3-1 Required Stopping Devices

Aerial lift category	Service Brake	Drive sheave brake	Rollback device	Retarding device (see 3.1.2.4)
Self braking: A lift that decelerates, stops & remains stopped within the service brake performance requirements without a braking device	Required*	Required	Not Required	Not Required
Non-overhauling: A lift that will not accelerate in either direction when it is not driven, but is not self-braking	Required	Required	Not Required	Not Required
Overhauling reverse direction: A lift that will accelerate in the reverse direction when it is not driven	Required*	Required	Required	Not Required
Overhauling forward: A lift that will accelerate in the forward direction when it is not driven	Required	Required	Not Required	Required
* A service brake is not required if the overhauling, reverse direction aerial lift will meet the service brake stopping requirements under the most unfavorable design loading conditions				

3.1.2.6 Brakes and rollback devices.

May 15, 2006 to Present:

The aerial lift shall have the following friction-type brakes and other devices as specified in table 3-1:

- service brake (see 3.1.2.6.1);
- drive sheave brake (see 3.1.2.6.2);
- rollback device (see 3.1.2.6.3).

All braking systems shall be designed and monitored to ensure that:

- a) once the aerial lift begins movement in the intended direction, the brakes are maintained in the open position;
- b) the service brake shall not open prior to the drive system developing sufficient torque to prevent overhauling;

EXCEPTION – For an aerial lift that overhauls only in the reverse direction, a drive train backstop (3.1.2.6.4) may be used in lieu of the above.

- c) multiple brakes or brake systems shall not be simultaneously applied such that excessive deceleration is applied to the aerial lift under any anticipated conditions of loading;
- d) the failure of one braking system to properly decelerate the aerial lift shall automatically initiate a second braking system, if any.

The service brake, drive sheave brake, and rollback device shall be designed such that failure of one braking system will not impair the function of the other systems. All brakes shall have the braking force applied by springs, weights, or other approved forms of stored energy.

The service brake, drive sheave brake, and rollback device shall be designed to assure operation under all anticipated conditions.

Each braking system shall be capable of operation to comply with daily inspections and periodic testing.

The manufacturer or a Qualified Engineer shall furnish a written procedure to be followed and specify the auxiliary equipment necessary for periodic testing and adjustment of the holding force of each brake, rollback, and backstop device. The procedure shall additionally specify:

- e) the minimum and maximum holding force for the service brake and drive sheave brake independently, and;
- f) the minimum and maximum stopping distance for the service brake and drive sheave brake independently, with a specified loading condition.

This baseline procedure shall be performed at the completion of the acceptance test and then at the frequency specified in order to demonstrate the ability of each brake to produce the required force.

Testing shall be accomplished as part of normal maintenance during the operating season, but shall not be performed when the aerial lift is open to the public. As a minimum, this testing shall be performed monthly during the operating season.

If a device is permanently installed to cause a brake, or rollback device, to be disabled for testing or reverse rotation, it shall be electronically monitored so that the aerial lift cannot be operated in its normal mode when the brake is so disabled.

Prior to May 15, 2006:

The aerial lift shall have the following friction-type brakes and other devices as specified in table 3-1:

- service brake (see 3.1.2.6.1);
- drive sheave brake (see 3.1.2.6.2);
- rollback device (see 3.1.2.6.3).

All braking systems shall be designed and monitored to ensure that:

- a) once the aerial lift begins movement in the intended direction, the brakes are maintained in the open position;
- b) the service brake shall not open prior to the drive system developing sufficient torque to prevent overhauling;

EXCEPTION – For an aerial lift that overhauls only in the reverse direction, a drive train backstop (3.1.2.6.4) may be used in lieu of the above.

c) multiple brakes or brake systems shall not be simultaneously applied such that excessive deceleration is applied to the aerial lift under any anticipated conditions of loading;

d) the failure of one braking system to properly decelerate the aerial lift shall automatically initiate a second braking system, if any.

The service brake, drive sheave brake, and rollback device shall be designed such that failure of one braking system will not impair the function of the other systems, and all brakes shall have the braking force applied by springs, weights, or other approved forms of stored energy.

The service brake, drive sheave brake, and rollback device shall be designed to assure operation under all anticipated conditions.

Deceleration rates specified in 3.1.2.4 shall be achieved by each brake without the aid of other braking devices or drive regeneration.

Each braking system shall be capable of operation to comply with daily inspections and periodic testing.

A Qualified Engineer shall furnish a written procedure to be followed and specify the auxiliary equipment necessary for periodic testing and adjustment of the holding force of each brake, rollback, and backstop device. This procedure shall be performed during the acceptance test, and then at the frequency specified, to demonstrate the ability of each brake to produce the required torque.

Such testing shall be accomplished as part of normal maintenance during the operating season, but shall be performed when the aerial lift is not open to the public.

If a device is permanently installed to cause a brake, or rollback device, to be disabled for testing or reverse rotation, it shall be electronically monitored so that the aerial lift cannot be operated in its normal mode when the brake is so disabled.

3.1.2.6.1 Service brake.

The service brake can be located at any point in the drive train such that there is no belt, friction clutch, or similar friction-type device between the brake and the drive sheave. The service brake shall not act on the same braking surface as the drive sheave brake.

The service brake shall be an automatic brake to stop and hold the aerial lift under the most unfavorable design loading condition. Deceleration rates specified in 3.1.2.5 shall be achieved by the service brake without the aid of other braking devices or drive regeneration.

The brake shall be in a normally applied position. It shall be held open for operation of the aerial lift and shall be applied when its power is removed or the aerial lift is stopped.

3.1.2.6.2 Drive sheave brake.

The drive sheave brake shall operate on the drive sheave assembly.

The drive sheave brake shall be an automatic brake to stop and hold the aerial lift under the most unfavorable design loading condition. Deceleration rates specified in 3.1.2.5 shall be achieved by the drive sheave brake without the aid of other braking devices or drive regeneration.

Application of the drive sheave brake shall automatically disconnect the power source to the power unit in use. This brake shall act automatically when the speed of the haul rope exceeds the design value by 15% in either direction.

3.1.2.6.3 Rollback device.

The rollback device shall act directly on the drive sheave assembly or on the haul rope. Under the most unfavorable design loading condition, the rollback device shall automatically control reverse rotation of the aerial lift, as defined herein. The rollback device shall bring the aerial lift to a stop if unintentional reverse rotation occurs. The rollback device shall be activated if the haul rope travels in excess of 36 inches (915 mm) in the reverse direction (see 3.2.3.7 for electrical requirements).

3.1.2.6.4 Drive train backstop.

A drive train backstop device may be installed on an aerial lift. If used, it shall conform to the following requirements:

- a) A drive train backstop device is a one-way or overrunning clutch device. The drive train shall be so arranged that there is no belt, friction clutch, or similar friction-type device between the backstop device and the drive sheave;
- b) The backstop device shall be rated for the maximum design load;
- c) Under the most unfavorable design loading condition, the backstop device shall automatically prevent reverse rotation of the aerial lift before the aerial lift travels in excess of 36 inches (915 mm) in the reverse direction.

3.1.2.7.4 Other machinery locations.

Jan. 1, 1988 to present:

The acceleration/deceleration areas, conveyor areas, and associated access ways shall be well ventilated. These areas shall have a permanently installed lighting system which is adequate for proper machinery maintenance and safety of personnel. Access ways shall be provided for inspection and proper maintenance while the equipment is in operation. Access ways shall have:

- (1) Stairs or secured ladder.
- (2) Skid resistant floors, platforms, or catwalks which provide access as defined in subparagraph three herein to all manual and automatic safety devices (switches) and tensioning system components. Access to other areas shall be denied while equipment is in operation.
- (3) A minimum vertical clearance of 80 inches (2 m), and a minimum horizontal clearance of 24 inches (61 cm). If a component crosses the access way, vertical clearance may be reduced as follows: a) a minimum of 60 inches (152 cm), for a maximum distance of 36 inches (92 cm); or b) a minimum of 48 inches (122 cm), for a maximum distance of 12 inches (30.5 cm). If the obstruction exceeds 15 inches (38 cm), in height, above the floor, stairs shall be provided to allow passage over the obstruction.
- (4) Railings protecting floor openings and moving machine parts. Moving parts shall be considered guarded if they are located a minimum of 12 inches (30.5 cm) from the vertical plane of the railing. Railings shall consist of a top rail, located 36 - 42 inches (91-106 cm) from the walking surface; a mid rail, located approximately midway between top rail and walking surface; and a 4 inch high (10 cm) solid toe plate. Railings shall be designed and constructed to resist anticipated loadings.

The requirements of rules 3.1.2.6.1 and 3.1.2.6.4, as revised, shall be in effect for all installations constructed subsequent to January 1, 1988. For all installations completed prior to January 1, 1988 reasonable compliance with Rules 3.1.2.6.1 and 3.1.2.6.4 as revised shall be accomplished prior to November 1, 1990.

Prior to Jan 1, 1988:
Not required.

3.1.2.7.5 Egress.

Jan. 1, 1994 to Present:

Permanent stairs and walkways shall be provided for egress from all machinery areas. The maximum angle of inclination for the stairs shall not exceed 70 degrees. Stairs and walkways shall have a minimum width of 18 inches. Stair treads shall have a minimum depth of 4 inches. Walkway surfaces and stair treads shall be constructed of non-skid bar grating or expanded metal. Handrails shall be provided.

Prior to Jan 1, 1994:
Not required.

3.1.2.8.2 Hall rope terminal sheaves (Bullwheel and deflection sheaves):

Haul rope terminal sheave frames shall be designed to retain the rope in the event of the failure of the sheave, shaft, or mounting. In instances where the sheave is cantilevered, the design working stresses shall not be more than 60% of those otherwise allowable.

The minimum diameter of terminal sheaves shall be 72 times the nominal diameter of the haul rope. The sheave assembly shall be designed to retain the haul rope in the event of a deropement from the sheave. A flange extension of 1-½ times the rope diameter (measured from the bottom of the rope groove) shall be deemed adequate for retention.

Haul rope terminal sheaves that act as driving, braking, or holding sheaves shall be so designed tht the haul rope does not slip in the sheave groove. The design coefficient of friction for a particular sheave liner shall not exceed the following values:

<u>Sheave Liner</u>	<u>Coefficient of Friction</u>
Steel or cast iron grooves	0.070
Leather	0.150
Rubber, neoprene, or other	0.205

3.1.2.10 Tension systems.

Prior to May 15, 2006:

Counterweights, hydraulic and pneumatic cylinders, or other suitable devices shall be used to provide the tensioning requirements of the particular installation. All devices used to provide the tension shall have sufficient travel to adjust to all normal operating changes in loading and temperature.

The tension for haul ropes and track cables for all modes of operation shall be determined by the design engineer. Tension systems may be automatic or manual; however, all systems shall have monitoring equipment that will automatically prevent operation outside of design limits (see 3.1.2.11.2(c)).

Tension systems may be adjustable to provide proper tensions for different modes of aerial lift operation.

The tension system design shall consider changes, for each mode of operation, in tensions due to rope elongation, friction, and other forces affecting traction on driving, braking, or holding sheaves, tower and sheave loading, and maximum vertical loads on grips to assure that tensions remain within design limits.

3.1.2.10.1 Hydraulic and pneumatic systems. (Previously 3.1.2.9.1 in ANSI 1999)

Hydraulic and pneumatic cylinders, when used, shall have sufficient ram travel to accommodate all normal operating changes in loading and temperature. Provisions shall be made to keep the cylinder free from

climatic-induced conditions and contaminants that may interfere with free movement.

If the system fails to provide the design operating pressure, the aerial lift shall be able to be operated to unload passengers.

Cylinders and their attachments shall each have a minimum factor of safety of 5. The factor of safety is equal to the ultimate tensile strength of the cylinder divided by the maximum steady state design tension.

The systems providing operating pressure for the cylinder shall have a minimum factor of safety of 5 unless a high velocity check valve or flow control device is used where the pressure line is connected to the cylinder. The check valve shall be rated to hold twice the normal operating pressure. The remainder of the system shall not exceed the manufacturer's published working pressure. Provisions shall be made to restrict the movement of pressure lines or hoses should they become severed under pressure. When pneumatic storage cylinders, accumulators, or other similar devices are used, they shall be located so that they cannot be knocked over or damaged.

3.1.2.10.2 Counterweights. (Previously 3.1.2.9.2 in ANSI 1999)

Counterweights, when used, shall be arranged to move freely up and down. Enclosures for counterweights shall be provided where necessary to prevent snow, ice, water, and other materials from accumulating under and around the counterweights and interfering with their free movement. Visual access shall be provided to areas beneath and above all counterweights contained in enclosures or pits. When a counterweight is contained in a structural frame, guides shall be provided to protect the frame and to ensure free movement of the counterweight. Where snow enclosures are not required, guardrails or enclosures shall be provided to prevent unauthorized persons from coming in contact with or passing under counterweights.

3.1.2.10.3 Wire ropes in tension systems. (Previously 3.1.2.9.3 in ANSI 1999)

Wire ropes in tension systems shall have a minimum factor of safety of 6 when new (see 7.1.3.1). On arrangements involving rope reeving, the maximum design static tension with sheave friction taken into account shall be the basis for determining the factor of safety. See 7.3 for additional requirements. No rotation-resistant ropes shall be used in tension systems (see 1.4 B *rotation-resistant rope*).

Wire ropes in tension systems shall be adjusted so that the counterweight will reach the end of its travel before the attached tension sheave carriage comes within 6 inches (150 mm) of the end of its travel. When wire ropes are used with pneumatic or hydraulic cylinders, they shall be adjusted so that connecting devices will not contact the reeving devices before the ram reaches the travel limits of the cylinder.

3.1.2.10.4 Chains in tension systems. (Previously 3.1.2.9.4 in ANSI 1999)

Roller, leaf, or welded link chains may be used in tension systems (see section 7).

For chain used as a tensioning component, where the chain does not pass through or around sprockets, the minimum factor of safety shall be 5 (see 7.1.3.3). For applications of chain where any sprockets are used, the minimum factor of safety shall be 6.

3.1.2.10.5 Cable winches or chain-adjusting devices. (Previously 3.1.2.9.5 in ANSI 1999)

Winches or other mechanical devices that are used for take-up and remain part of the system shall have a minimum factor of safety of 6 against their ultimate capacity. They shall have a positive lock against release. Where this factor cannot be established by the manufacturer's endorsement, a device shall be installed on the tension system rope or chain ahead of the winch/mechanical device that will keep the tension system intact in the event of a failure or release of the device.

The diameter of the winding drum shall not be less than the specified minimum sheave diameters referenced

as Condition C in 3.1.2.7.3 for rope.

3.1.3.1 Towers.

Prior to Nov. 1, 1991:

The design of the tower structure and foundation shall be in accordance with the requirements of 3.1.1.6. Where guyed towers are used and guys intersect the ground within or near ski runs, the guys shall be marked for visibility.

Means shall be provided for ready access from the ground to all tower tops. Permanent ladders are required for heights above those accessible by portable ladders.

Portable ladders, if used, shall be in at least sufficient quantity to be available at each point where attendants are positioned. Portable ladders extending more than 20 feet (6.10 meters) shall not be used.

Towers shall be identified with successive numbers clearly visible to passengers.

Where towers are designed to permit variations in rope height, sheave unit supports shall be guided and attached so as to prevent misalignment by rotation

3.1.3.3.2 Sheave and sheave unit design

May 15, 1994 to May 15, 2006:

Sheave flanges shall be as deep as possible, considering other features of the system. At the same time, rope grips shall be designed in relation to the sheave groove so as not to contact sheave flanges during normal operations, taking into consideration the anticipated amount of wear of the sheave liner groove. Grips shall be allowed to contact sheave flanges adjacent to the haul rope when the carrier swings, provided that this is considered in the design of the grips and sheaves. Furthermore, rope grips, sheave flanges, and hanger guides shall be designed so that hangers cannot be caught behind guides, and so that haul ropes and grips cannot be deroped from sheaves if the carrier is swinging within design limits as it approaches or passes the tower.

Suitable guards, of sufficient strength to resist the lateral forces caused by an inside deropement, shall be installed.

Construction of the entire sheave unit shall be such that the haul rope cannot become entangled in the sheave unit in the event the rope leaves the sheave toward the outside.

On each sheave unit, rope-catching devices shall be installed to reduce the risk of the haul rope moving excessively in the direction of the load on the sheave unit in the event of deropement. These devices shall be located less than one-half the diameter of the sheaves from the normal operating position of the rope and shall extend a minimum of two rope diameters beyond the sheave flange. Alternatively, when the catcher is located so that the rope cannot move in the direction of the load when it passes from the edge of the sheave to a position in the catcher, the catcher shall extend a minimum of two rope diameters beyond the center of the rope when the rope has reached the point where the deropement switch device initiates a stop. Rope-catching devices shall be designed to permit the passage of the haul rope and grips after deropement. The catcher shall be independent from the sheave.

On each sheave unit, suitable deropement switch devices shall be installed and maintained that will stop the lift in case of deropement.

On lifts where the carrier speed exceeds 600 feet per minute (3.0 meters per second), at least one device that senses the position of the rope shall be installed on each sheave unit. The device shall initiate a stop before the rope leaves the sheave in the horizontal direction or when the rope is displaced in the vertical direction by one rope diameter plus the distance that the rope is displaced vertically from the sheave by the grip.

If the gage of the haul rope system is varied at any point along the line, the horizontal departure at any one tower shall be provided for in the design so that deropement cannot occur by virtue of such a departure.

Sheave mounts or mounting frames shall be designed to be adjustable, allowing the sheave units to be aligned and held in the plane of the rope.

See also 3.1.1.4 through 3.1.1.4.7 for the effect of tower height and location on sheave units.

Prior to May 15, 1994:

Sheave flanges shall be as deep as possible, considering other features of the system. At the same time, rope grips shall be designed in relation to the sheave groove so as not to contact sheave flanges during normal operations, taking into consideration the anticipated amount of wear of the sheave liner groove. Grips shall be allowed to contact sheave flanges adjacent to the haul rope when the carrier swings, provided that this is considered in the design of the grips and sheaves. Furthermore, rope grips, sheave flanges, and hanger guides shall be designed so that hangers cannot be caught behind guides, and so that haul ropes and grips cannot be deroped from sheaves if the carrier is swinging within design limits as it approaches or passes the tower.

Suitable guards, of sufficient strength to resist the lateral forces caused by an inside deropement, shall be installed to prevent the rope from falling into a dangerous position within the tower structure.

Construction of the entire sheave unit shall be such that the haul rope cannot become entangled in the sheave unit in the event the rope leaves the sheave toward the outside.

On each sheave unit, rope-catching devices shall be installed to reduce the risk of the haul rope moving excessively in the direction of the load on the sheave unit in the event of deropement. These devices shall be located less than one-half the diameter of the sheaves from the normal operating position of the rope and shall extend a minimum of two rope diameters beyond the sheave flange. They shall be designed to permit the passage of the haul rope and grips after deropement.

On each sheave unit, suitable deropement switch devices shall be installed and maintained that will stop the lift in case of deropement.

If the gage of the haul rope system is varied at any point along the line, the horizontal departure at any one tower shall be provided for in the design so that deropement cannot occur by virtue of such a departure.

Sheave mounts or mounting frames shall be designed to be adjustable, allowing the sheave units to be aligned and held in the plane of the rope.

See also 3.1.1.4 through 3.1.1.4.7 for the effect of tower height and location on sheave units.

3.1.4.4.2 Cabin.

May 15, 2000 to May 15, 2006:

Fully enclosed passenger cabins shall be ventilated. They shall be equipped with doors that fill the entire entrance opening. The minimum clearance width opening shall be 32 inches (815 mm). Each door shall be provided with a lock located in such a manner that it can be unlocked only by authorized persons or by automatic means.

The horizontal gap between the cabin door opening floor edge and platform edge shall not be greater than 1 inch (25.4 mm). The height of the cabin floor to the platform shall be within $\pm \frac{1}{2}$ inch (± 12.7 mm). Where it is not operationally or structurally practical to meet these requirements, platform devices, vehicle devices, system devices, or bridge plates shall be provided for independent loading.

All windows shall be of shatter-resistant material.

Means of emergency evacuation of passengers shall be provided.

The maximum capacity of each cabin, both in pounds and kilograms and number of passengers, shall be posted in a conspicuous place in each cabin (see table D-1(r)).

The minimum clear floor space in accessible cabins shall be 48 inches by 30 inches (1220 mm x 760 mm). Where special accessible cabins are used, it is recommended the waiting interval should not exceed 10 minutes.

All carriers shall be clearly identified with numbers located on each end of each carrier.

Semi-open carriers shall meet applicable requirements for enclosed cabins and open chairs.

Jan. 1, 1994 to May 15, 2000:

Fully enclosed passenger cabins shall be ventilated. They shall be equipped with doors that fill the entire entrance opening. Each door shall be provided with a lock located in such a manner that it can be unlocked only by authorized persons or by automatic means.

All windows shall be of shatter-resistant material.

Means of emergency evacuation of passengers shall be provided.

The maximum capacity of each cabin, both in pounds and kilograms and number of passengers, shall be posted in a conspicuous place in each cabin.

If passengers are to remain standing, floor space of 2.5 square feet (0.23 square meter) per person shall be available; the width of cabin seats shall be at least 18 inches (46 cm) per person.

All carriers shall be clearly identified with numbers located on each end of each carrier.

Semi-open carriers shall meet applicable requirements for enclosed cabins and open chairs.

3.2.1.1 Applicable codes.

May 15, 2000 to May 15, 2006:

All electrical systems shall comply with 3.2.1.1 Applicable codes of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical systems shall comply with 3.2.1.1 Applicable codes of the B77.1-1992 ANSI Standard.

Nov. 1, 1991 to Jan 1, 1994:

All electrical systems shall comply with 3.2.1.1 Applicable codes of the B77.1-1990 ANSI Standard.

Jan. 1, 1984 to Nov 1, 1991:

All electrical systems shall comply with 3.2.1.1 Applicable codes of the B77.1-1982 ANSI Standard.

Jan 1, 1977 to Jan. 1, 1984:

All electrical work shall comply with 3.2.1.1 Applicable codes of the B77.1-1976 ANSI Standard.

Jan 1, 1974 to Jan. 1, 1977:

All electrical work shall comply with 3.2.1.1 Applicable codes of the B77.1-1973 ANSI Standard.

Jan 1, 1972 to Jan 1, 1974:

All electrical work shall comply with 3.2.1.1 Applicable codes of the B77.1-1970 ANSI Standard.

Prior to Jan 1, 1972:

All electrical work shall comply with 3.2.1.1 Applicable codes of the B77.1-1960 ANSI Standard.

3.2.1.2 Location.

May 15, 2000 to May 15, 2006:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 3.2.1.2 Location of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 3.2.1.2 Location of the B77.1-1992 ANSI Standard.

Nov. 1, 1991 to Jan 1, 1994:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 3.2.1.2 Location of the B77.1-1990 ANSI Standard.

Jan. 1, 1984 to Nov 1, 1991:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 3.2.1.2 Location of the B77.1-1982 ANSI Standard.

Prior to Jan. 1, 1984:

All exposed electrical power transmission wiring shall be so located that in case of collapse or breakage of the power line it will not come into contact with carriers, ropes, or passengers.

3.2.1.3 Protection.

Prior to May 15, 2006:

All transformer stations and other high voltage electrical equipment shall be marked with conspicuous warning signs and shall be protected so as to prevent unauthorized persons from entering the area or coming in contact with any portion of the equipment or wiring. All power equipment shall be protected against overloads by circuit breakers or fuses.

3.2.1.4 Overhead cables.

Prior to May 15, 2006:

Signal, communication, and control circuits may be supported between towers that support the aerial lift. Voltage on overhead or exposed circuits shall be limited to 50 volts with the exception of the intermittent ring-down circuits for telephone systems.

3.2.1.5.5 Ground fault interrupter protection.

Prior to May 15, 2006:

Not required.

3.2.1.6.3 Haul rope grounding.

Jan 1, 1984 to Present:

Grounding sheaves with conductive liners or equivalent means should be provided at each end of the tramway for the purpose of grounding haul ropes and track cables, as applicable, for static electrical discharge. For the haul rope on bicable systems or monocable systems with an isolated or insulated haul rope incorporated in the operating circuitry, no means of grounding are required when the operating circuit takes into consideration static electrical discharge.

Prior to Jan 1, 1984:
Not required.

3.2.3.2 Stop gates.

On aerial lifts using chairs, an automatic stopping device beyond each unloading area are required where passengers wearing skis are required to disembark. The device shall automatically stop the aerial lift in the event a passenger rides beyond the intended point of unloading. The operation of the automatic stop device may be delayed or overridden momentarily by the operator or attendant.

3.3.1.2.1 Requirements for signs.

- (a) The design of any sign as well as its support and the installation procedure of such sign shall be considered a minor modification if the sign or aggregate of signs on a given tower is greater than three feet square (nine square feet).
- (b) Signs, fasteners, or supporting members shall not interfere with the operation of the tramway.
- (c) The design of structural components shall be reviewed to consider the increase in loading caused by any sign.
- (d) Signs shall not interfere with passenger or attendant vision.

3.3.1.3 Operational plan for transportation of recreational equipment. Each licensee shall have an operational plan that has procedures for transportation of sports equipment and recreational devices by foot passengers. This plan shall be consistent with the tramway manufacturer's specifications and instructions, if any.

3.3.4.3.1 Acceptance criteria for grips and hangers - minimum requirements. The following shall be considered the minimum requirements for an acceptance criteria.

- (1) Qualifications for testing personnel;
- (2) Sampling size and method of obtaining the sample;
- (3) Allowable rejection rate and retest procedures;
- (4) Types of inspections to be performed and the procedures to be used;
- (5) Criteria for acceptance/rejection of samples;
- (6) Certification from the manufacturer/design engineer that the testing procedures are acceptable to detect faulty materials.

Section 4 Fixed grip aerial lifts

Note: Timeframes relate to the ropeway installation date or modification date whichever controls, unless otherwise noted.

4.1.1.3.1 Location of power lines.

Jan. 1, 1977 to Present:

Power lines shall be located a minimum distance equal to the height of poles or support structures from any passenger tramway so that poles and electrical lines cannot touch any portion of the tramway, loading or unloading points or platforms and tow path, if applicable, upon collapse of poles or lines, unless suitable and approved precautions are taken to safeguard human lives.

4.1.1.3.2 Air space requirements.

4.1.1.3.2.1 Structures.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

May 15, 2000 to Present:

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by vertical planes commencing at a point thirty-five (35) feet from the intersection of the vertical planes of the ropes or cables and ground surface.

For purposes of this rule, buildings controlled by the licensee used primarily for maintenance and operation of the lift and other tramways shall not be considered structures; however, buildings must comply with the following.

- (1) No flammable liquids may be stored in the building outside of a UL listed container or storage cabinet, unless such flammable liquids are in the original containers and intended for daily usage. Quantities must be consistent with normal daily use. Class I or II flammable storage materials shall be limited to 2 gallons in a UL listed container and must be stored either in an outside storage area or in a UL listed cabinet.
- (2) The building must be within the view of the attendant but not impair the sight line of the lift.
- (3) Entrances to all machinery, operators', and attendants' rooms shall be locked when not in use. Unattended entrances accessible to public, which may be left open, shall be equipped with barriers to prevent entry.

Jan. 1, 1994 to May 15, 2000:

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by planes having an outward slope of one horizontal and two vertical and commencing at a point twenty (20) feet horizontally outside of the intersection of the vertical planes of ropes or cables and ground surface.

Dec. 30, 1977 to Jan. 1, 1994:

No passenger tramway installation shall be permitted whenever the Passenger Tramway Operator does not have permanent and irrevocable control of the following air space (except when the passenger tramway is located on Forest Service land): the area bounded by planes having an outward slope of one horizontal and two vertical and commencing at a point twenty (20) feet horizontally outside of the intersection of the vertical planes of ropes or cables and ground surface.

Prior to Dec. 30, 1977:
None required

4.1.1.3.2.2 Cables or ropes.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

May 15, 2000 to Present:

Any cable or rope installed on or near a ropeway that may represent a hazard to the ropeway shall be monitored to automatically stop the ropeway if the cable or rope fails. Failure would be defined as per Section 23.1 (g).

EXCEPTION: Track or haul ropes are excluded from this rule.

Prior to May 15, 2000:
Not required

4.1.1.5.2 Clearances.

Jan. 1, 1984 to Nov. 1, 1991:

Terminals and towers shall be designed and installed to provide the clearances as herein specified and to minimize surge of the line under operating conditions. Local wind conditions shall be taken into consideration.

The minimum distance between passing carriers, each swung 10 degrees inward from the vertical, shall be the greater of the following:

- a) 2 feet 6 inches
- b) 1/2% of the span length (applies to gondolas only).

The distance between haul ropes, (or track cables), for the purpose of these checks, shall be considered as equal to the gauge of the line.

External structures, posts, or obstructions, other than lift structural components, shall have at least 4 feet (1.22 meters) of clearance from either edge of a loaded open carrier passenger seat or open cabin body (measured from the outermost attachments on or parts of the carrier while the carrier is hanging in a vertical position).

Dec. 31, 1977 to Jan. 1, 1984:

Terminals and towers shall be designed and installed to provide the clearances as herein specified and to minimize surge of the line under operating conditions. Local wind conditions shall be taken into consideration.

The minimum distance between passing carriers, each swung 10 degrees inward from the vertical, shall be the greater of the following:

- a) 2 feet 6 inches
- b) 1/2% of the span length (applies to gondolas only).

The distance between haul ropes, (or track cables), for the purpose of these checks, shall be considered as equal to the gauge of the line.

Prior to Dec. 31, 1977:

All towers shall be equipped with guards to prevent contact of carriers or hangers with a tower structure or tower machinery except that such guards shall not be required if such contact does not occur when the carrier is swung freely 15 degrees from the vertical position.

In the absence of guards described herein, the following minimum clearances shall prevail when the carrier is swung inward 10 degrees from the vertical position:

(1) on chair lifts

(a) 18 inches between inside limit of passenger seat and tower clearance line or surface.

(b) 12 inches between innermost point on chair structure and tower clearance line or structure.

(2) on Gondola lifts:

(a) With the windows open on the tower side, 18 inches between innermost point on carrier and tower clearance line or structure.

(b) With screened or closed windows on the tower side, 12 inches.

Guards shall be so shaped and located that a 30- degree lateral swing from vertical shall not place and part of the loaded or empty carrier on the inner side of the guard.

On all towers, with or without guards, when a carrier is swung longitudinally by 15 degrees, there shall be no contact between any obstruction and any part of the carrier.

4.1.1.5.2.2 Special requirements for chair lifts.

The following clearance requirements shall be met to prevent entanglement of skis with tower structure. Clearance is here defined to mean the distance between inner limit of passenger seat and clearance line or surface of tower.

With the chair swinging laterally 10 degrees from the vertical position, or to the limit permitted by the guards, if any, if clearance is less than 24 inches from any open frame tower or 18 inches from any closed tubular tower, guards shall be provided on the up-going side to keep skis from being caught in the structure. Such guards shall be at least 72 inches in height, extending 36 inches above and below average foot level.

A tubular tower with permanent ladder rungs shall be considered as an open frame tower, with the following exceptions:

(1) If the ladder rungs are on the uphill side and are covered by simple fascia boards or equivalent over the previously mentioned 72-inch range, the tower may be considered as a closed tubular tower with respect to uphill skier traffic.

(2) If it can be demonstrated that ski tips can not be caught in the rungs of the ladder, the tower may be considered as a closed tubular tower.

4.1.1.5.3 Terminal clearances.

Prior to Nov. 1, 1991:

Not required.

4.1.2.1.3 Power unit interlock.

Prior to May 15, 2006:

Not required.

4.1.2.6 Brakes and rollback devices.

May 15, 2006 to Present:

The aerial lift shall have the following friction-type brakes and other devices as specified in table 4-3:

– service brake (see 4.1.2.6.1);

– drive sheave brake (see 4.1.2.6.2);

– rollback device (see 4.1.2.6.3);

– drive train backstop (see 4.1.2.6.4).

All braking systems shall be designed to ensure that:

- a) once the aerial lift begins movement in the intended direction, the brakes are maintained in the open position;
- b) the service brake shall not open prior to the drive system developing sufficient torque to prevent overhauling.

EXCEPTION – For an aerial lift that overhauls only in the reverse direction, a drive train backstop may be used in lieu of the above.

- c) multiple brakes or brake systems shall not be simultaneously applied such that excessive deceleration is applied to the aerial lift under any anticipated conditions of loading;
- d) the failure of one braking system to properly decelerate the aerial lift shall automatically initiate a second braking system, on an overhauling forward direction aerial lift.

The service brake, drive sheave brake, rollback device, and drive train backstop device shall be designed such that failure of one system will not impair the function of the other systems. All brakes shall have the braking force applied by springs, weights, or other approved forms of stored energy.

The service brake, drive sheave brake, rollback, and drive train backstop devices shall be designed to assure operation under all anticipated conditions.

Each braking system shall be capable of operation to comply with daily inspections and periodic testing.

The manufacturer or a Qualified Engineer shall furnish a written procedure to be followed, and specify the auxiliary equipment necessary for periodic testing and adjustment of the holding force of each brake and backstop device. The procedure shall additionally specify:

- e) the minimum and maximum holding force for the service brake and drive sheave brake independently; and
- f) the minimum and maximum stopping distance for the service brake and drive sheave brake independently, with a specified loading condition.

This baseline procedure shall be performed at the completion of the acceptance test and then at the frequency specified in order to demonstrate the ability of each brake to produce the required force.

Testing shall be accomplished as part of normal maintenance during the operating season, but shall not be performed when the aerial lift is open to the public. As a minimum, this testing shall be performed monthly during the operating season.

If a device is permanently installed to cause a brake, rollback, or drive train backstop device to be disabled for testing, it shall be electronically monitored so that the aerial lift cannot be operated in its normal mode when the brakes are so disabled.

Table 4-3 - Required stopping devices

Lift category	Service Brake	Drive Sheave Brake	Rollback device	Drive train backstop	Retarding device (see 4.1.2.4)
Self-braking: A lift that decelerates, stops, & remains stopped within the service brake performance requirements without a braking device	Not Required	Required	Not Required	Not Required	Not Required
Nonoverhauling: A lift that will not accelerate in either direction when it is not driven, but is not self-braking	Required*	Required	Not Required	Not Required	Not Required
Overhauling, reverse direction: A lift that will accelerate in the reverse direction when it is not driven	Required	Required	Required	Required	Not Required
Overhauling, forward direction: A lift that will accelerate in forward direction when it is not driven	Required	Required	Not Required	Not Required	Required
* A service brake is not required if the overhauling, reverse direction lift will meet the service brake stopping requirements under most unfavorable design loading conditions.					

Prior to May 15, 2006:

The aerial lift shall have the following friction-type brakes and other devices as specified in table 4-3:

- service brake (see 4.1.2.6.1);
- drive sheave brake (see 4.1.2.6.2);
- rollback device (see 4.1.2.6.3);
- drive train backstop (see 4.1.2.6.4).

All braking systems shall be designed to ensure that:

- a) once the aerial lift begins movement in the intended direction, the brakes are maintained in the open position;
- b) the service brake shall not open prior to the drive system developing sufficient torque to prevent overhauling.

EXCEPTION – For an aerial lift that overhauls only in the reverse direction, a drive train backstop may be used in lieu of the above.

The service brake, drive sheave brake, rollback device, and drive train backstop device shall be designed such that failure of one system will not impair the function of the other systems, and all brakes shall have the braking force applied by springs, weights, or other approved forms of stored energy.

The service brake, drive sheave brake, rollback, and drive train backstop devices shall be designed to assure operation under all anticipated conditions.

Stopping distances specified in 4.1.2.5.1 shall be achieved by each brake without the aid of other braking devices or drive regeneration.

Each braking system shall be capable of operation to comply with daily inspections and periodic testing.

A Qualified Engineer shall furnish a written procedure to be followed, and specify the auxiliary equipment necessary for periodic testing and adjustment of the holding force of each brake and backstop device. This procedure shall be performed during the acceptance test, and at the frequency specified, to demonstrate the ability of each brake to produce the required torque.

Such testing shall be accomplished as part of normal maintenance during the operating season, but shall be performed when the aerial lift is not open to the public.

If a device is permanently installed to cause a brake, rollback, or drive train backstop device to be disabled for testing, it shall be electronically monitored so that the aerial lift cannot be operated in its normal mode when the brakes are so disabled.

Table 4-3 - Required stopping devices

Lift category	Service Brake	Drive Sheave Brake	Rollback device	Drive train backstop	Retarding device (see 4.1.2.4)
Self-braking: A lift that decelerates, stops, & remains stopped within the service brake performance requirements without a braking device	Not Required	Required	Not Required	Not Required	Not Required
Nonoverhauling: A lift that will not accelerate in either direction when it is not driven, but is not self-braking	Required*	Required	Not Required	Not Required	Not Required
Overhauling, reverse direction: A lift that will accelerate in the reverse direction when it is not driven	Required	Required	Required	Required	Not Required
Overhauling, forward direction: A lift that will accelerate in forward direction when it is not driven	Required	Required	Not Required	Not Required	Required

* A service brake is not required if the overhauling, reverse direction lift will meet the service brake stopping requirements under most unfavorable design loading conditions.

4.1.2.6.1 Service brake.

The service brake shall be located at any point in the drive train such that there is no belt, friction clutch, or similar friction-type device between the brake and the drive sheave. The service brake shall not act on the same braking surface as the drive sheave brake.

The service brake shall be an automatic brake to stop and hold the aerial lift under the most unfavorable design loading condition. The deceleration rate or stopping distance specified in 4.1.2.5 shall be achieved by the service brake without the aid of other braking devices or drive regeneration.

The brake shall be in a normally applied position. It shall be held open for operation of the aerial lift and shall be applied when the aerial lift is stopped.

4.1.2.6.2 Drive sheave brake.

The drive sheave brake shall operate on the drive sheave assembly.

The drive sheave brake shall be capable of being activated both manually and automatically to stop and hold the aerial lift under the most unfavorable design loading condition. Deceleration rates or stopping distances specified in 4.1.2.5 shall be achieved by the drive sheave brake without the aid of other braking devices or drive regeneration.

Application of the drive sheave brake shall automatically disconnect the power source to the power unit in use. This brake shall act automatically when the speed of the haul rope exceeds the design value by 15% in either direction of an overhauling lift.

4.1.2.6.3 Rollback device.

The rollback device shall act directly on the drive sheave assembly or on the haul rope. When it has been determined that under the most unfavorable design loading condition, haul rope slippage will not occur, the rollback device may be located at the return sheave assembly. However, the rollback device shall not be located at other than the drive station, unless its location will not decrease the factor of safety of the haul rope below the minimum permissible value whenever the rollback device is statically engaged.

Under the most unfavorable design loading condition, the rollback device shall automatically stop reverse rotation of the aerial lift before the haul rope travels in excess of 36 inches (915 mm) in the reverse direction (see 4.2.3.7 for electrical requirements).

4.1.2.6.4 Drive train backstop.

A drive train backstop device shall conform to the following requirements:

- a) A drive train backstop device is a one-way or overrunning clutch device. The drive train shall be so arranged that there is no belt, friction clutch, or similar friction-type device between the backstop device and the drive sheave;
- b) The backstop device shall be rated for the maximum design load;
- c) Under the most unfavorable design loading condition, the backstop device shall automatically prevent reverse rotation of the aerial lift before the aerial lift travels in excess of 36 inches (915 mm) in the reverse direction.

4.1.2.7.4 Egress.

Jan. 1, 1994 to Present:

Permanent stairs and walkways shall be provided for egress from all machinery areas. The maximum angle of inclination for the stairs shall not exceed 70 degrees. Stairs and walkways shall have a minimum width of 18 inches. Stair treads shall have a minimum depth of 4 inches. Walkway surfaces and stair treads shall be constructed of non-skid bar grating or expanded metal. Handrails shall be provided.

Prior to Jan 1, 1994:

Not required.

4.1.2.8.2 Hall rope terminal sheaves (Bullwheel and deflection sheaves):

Haul rope terminal sheave frames shall be designed to retain the rope in the event of the failure of the sheave, shaft, or mounting. In instances where the sheave is cantilevered, the design working stresses shall not be more than 60% of those otherwise allowable.

The minimum diameter of terminal sheaves shall be 72 times the nominal diameter of the haul rope. The sheave assembly shall be designed to retain the haul rope in the event of a deropement from the sheave. A

flange extension of 1-½ times the rope diameter (measured from the bottom of the rope groove) shall be deemed adequate for retention.

Haul rope terminal sheaves that act as driving, braking, or holding sheaves shall be so designed tht the haul rope does not slip in the sheave groove. The design coefficient of friction for a particular sheave liner shall not exceed the following values:

<u>Sheave Liner</u>	<u>Coefficient of Friction</u>
Steel or cast iron grooves	0.070
Leather	0.150
Rubber, neoprene, or other	0.205

4.1.2.10 Tension systems.

Prior to May 15, 2006:

Counterweights, hydraulic and pneumatic cylinders, or other suitable devices shall be used to provide the tensioning requirements of the particular installation. All devices used to provide the tension shall have sufficient travel to adjust to all normal operating changes in loading and temperature.

The tension for haul ropes for all modes of operation shall be determined by the design engineer. Tension systems may be automatic or manual; however, all systems shall have monitoring equipment that will automatically prevent operation outside of design limits (see 4.1.2.11.2(c)).

Tension systems may be adjustable to provide proper tensions for different modes of aerial lift operation.

The tension system design shall consider changes, for each mode of operation, in tensions due to rope elongation, friction and other forces affecting traction on driving, braking, or holding sheaves, tower and sheave loading, and maximum vertical loads on grips to assure that tensions remain within design limits.

4.1.2.10.1 Hydraulic and pneumatic systems. (Previously 4.1.2.9.1 in ANSI 1999)

Hydraulic and pneumatic cylinders, when used, shall have sufficient ram travel to accommodate all normal operating changes in loading and temperature. Provisions shall be made to keep the cylinder free from climatic-induced conditions and contaminants that may interfere with free movement.

If the system fails to provide the design operating pressure, the aerial lift shall be able to be operated to unload passengers.

Cylinders and their attachments shall each have a minimum factor of safety of 5. The factor of safety is equal to the ultimate tensile strength of the cylinder divided by the maximum steady-state design tension.

The systems providing operating pressure for the cylinder shall have a minimum factor of safety of 5 unless a high-velocity check-valve or flow-control device is used where the pressure line is connected to the cylinder. The check-valve shall be rated to hold twice the normal operating pressure. The remainder of the system shall not exceed the manufacturer's published working pressures. Provisions shall be made to restrict the movement of pressure lines or hoses should they become severed under pressure. When pneumatic storage cylinders, accumulators, or other similar devices are used, they shall be located so that they cannot be knocked over or damaged.

4.1.2.10.2 Counterweights. (Previously 4.1.2.9.2 in ANSI 1999)

Counterweights, when used, shall be arranged to move freely up and down. Enclosures for counterweights shall be provided where necessary to prevent snow, ice, water, and other materials from accumulating under and around the counterweights and interfering with their free movement. Visual access shall be provided to

areas beneath and above all counterweights contained in enclosures or pits. When a counterweight is contained in a structural frame, guides shall be provided to protect the frame and to ensure free movement of the counterweight. Where snow enclosures are not required, guardrails or enclosures shall be provided to prevent unauthorized persons from coming in contact with or passing under counterweights.

4.1.2.10.3 Wire ropes in tension systems. (Previously 4.1.2.9.3 in ANSI 1999)

Wire ropes in tension systems shall have a minimum factor of safety of 6 when new (see 7.1.3.1). On arrangements involving rope reeving, the maximum design static tension with sheave friction taken into account shall be the basis for determining the factor of safety. See 7.3 for additional requirements. No rotation-resistant ropes shall be used in tension systems (see 1.4 B *rotation-resistant ropes*).

Wire ropes in tension systems shall be adjusted so that the counterweight will reach the end of its travel before the attached tension sheave carriage comes within 6 inches (150 mm) of the end of its travel. When wire ropes are used with pneumatic or hydraulic cylinders, they shall be adjusted so that connecting devices will not contact the reeving devices before the ram reaches the travel limits of the cylinder.

4.1.2.10.4 Chains in tension systems. (Previously 4.1.2.9.4 in ANSI 1999)

Roller, leaf, or welded link chains may be used in tension systems (see section 7).

For chain used as a tensioning component, where the chain does not pass through or around sprockets, the minimum factor of safety shall be 5 (see 7.1.3.3). For applications of chain where any sprockets are used, the minimum factor of safety shall be 6.

4.1.2.10.5 Cable winches or chain adjusting devices. (Previously 4.1.2.9.5 in ANSI 1999)

Winches or other mechanical devices that are used for take-up and remain part of the system shall have a minimum factor of safety of 6 against their ultimate capacity. They shall have a positive lock against release. Where this factor cannot be established by the manufacturer's endorsement, a device shall be installed on the tension system rope or chain ahead of the winch/mechanical device that will keep the tension system intact in the event of failure or release of the device.

The diameter of the winding drum shall not be less than the specified minimum sheave diameters referenced as Condition C in 4.1.2.7.3 for rope.

4.1.3.1 Towers.

Prior to Nov. 1, 1991:

The design of the tower structure and foundation shall be in accordance with the requirements of 4.1.1.6. Where guyed towers are used and guys intersect the ground within or near ski runs, the guys shall be marked for visibility.

Means shall be provided for ready access from the ground to all tower tops. Permanent ladders are required for heights above those accessible by portable ladders.

Portable ladders, if used, shall be in at least sufficient quantity to be available at each point where attendants are positioned. Portable ladders extending more than 20 feet (6.10 meters) shall not be used.

Towers shall be identified with successive numbers clearly visible to passengers.

Where towers are designed to permit variations in rope height, sheave unit supports shall be guided and attached so as to prevent misalignment by rotation

4.1.3.3.2 (g) Sheave and sheave unit design.

Prior to May 15, 1994:

Sheave flanges shall be as deep as possible, considering other features of the system. At the same time, rope grips shall be designed in relation to the sheave groove so as not to contact sheave flanges during normal operations, taking into consideration the anticipated amount of wear of the sheave liner groove. Grips shall be allowed to contact sheave flanges adjacent to the haul rope when the carrier swings, provided that this is considered in the design of the grips and sheaves. Furthermore, rope grips, sheave flanges, and hanger guides shall be designed so that hangers cannot be caught behind guides, and so that haul ropes and grips cannot be deroped from sheaves if the carrier is swinging within design limits as it approaches or passes the tower.

Suitable guards, of sufficient strength to resist the lateral forces caused by an inside deropement, shall be installed.

Construction of the entire sheave unit shall be such that the haul rope cannot become entangled in the sheave unit in the event the rope leaves the sheave toward the outside.

On each sheave unit, rope-catching devices shall be installed to reduce the risk of the rope moving excessively in the direction of the load on the sheave unit in the event of deropement. These devices shall be located less than one-half the diameter of the sheaves from the normal operating position of the rope and shall extend a minimum of two rope diameters beyond the sheave flange. Alternatively, when the catcher is located so that the rope cannot move in the direction of the load when it passes from the edge of the sheave to a position in the catcher, the catcher shall extend a minimum of two rope diameters beyond the center of the rope when the rope has reached the point where the deropement switch device initiates a stop. Rope-catching devices shall be designed to permit the passage of the haul rope and grips after deropement. The catcher shall be independent from the sheave.

On each sheave unit, suitable deropement switch devices shall be installed and maintained that will stop the lift in case of deropement.

On lifts where the carrier speed exceeds 600 feet per minute (3.0 meters per second), at least one device that senses the position of the rope shall be installed on each sheave unit. The device shall initiate a stop before the rope leaves the sheave in the horizontal direction or when the rope is displaced in the vertical direction by one rope diameter plus the distance that the rope is displaced vertically from the sheave by the grip.

If the gage of the haul rope system is varied at any point along the line, the horizontal departure at any one tower shall be provided for in the design so that deropement cannot occur by virtue of such a departure.

Sheave mounts or mounting frames shall be designed to be adjustable, allowing the sheave units to be aligned and held in the plane of the rope.

See also 4.1.1.4 through 4.1.1.4.3 for the effect of tower height and location on sheave units.

4.1.4.4.2 Cabin.

May 15, 2000 to May 15, 2006:

Fully enclosed passenger cabins shall be ventilated. They shall be equipped with doors that fill the entire entrance opening. The minimum clearance width opening shall be 32 inches (815 mm). Each door shall be provided with a lock located in such a manner that it can be unlocked only by authorized persons or by automatic means.

The horizontal gap between the cabin door opening floor edge and platform edge shall not be greater than 1 inch (25.4mm). The height of the cabin floor and the platform shall be within $\pm \frac{1}{2}$ inch (± 12.7 mm). Where it is not operationally or structurally practical to meet these requirements, platform devices, vehicle devices, system devices, or bridge plates shall be provided for independent loading.

All windows shall be of shatter-resistant material.

Means of emergency evacuation of passengers shall be provided.

The maximum capacity of each cabin, both in pounds and kilograms and number of passengers, shall be posted in a conspicuous place in each cabin (see Annex D).

The minimum clear floor space in accessible cabins shall be 48 inches by 30 inches (1220 mm X 760 mm). Where special accessible cabins are used, it is recommended the waiting interval should not exceed 10 minutes.

All carriers shall be clearly identified with numbers located on each end of each carrier.

Semi-open carriers shall meet applicable requirements for enclosed cabins and open chairs.

Jan. 1, 1994 to May 15, 2000:

Fully enclosed passenger cabins shall be ventilated. They shall be equipped with doors that fill the entire entrance opening. The minimum opening door width shall be 32 inches (815 mm). Each door shall be provided with a lock located in such a manner that it can be unlocked only by authorized persons or by automatic means.

The horizontal gap between the cabin door opening floor edge and platform edge shall not be greater than 1 inch (25.4mm). The height of the cabin floor and the platform shall be within 2 inch (12.7mm). Where it is not operationally or structurally practical to meet these requirements, platform devices, vehicle devices, system devices, or bridge plates shall be provided for independent loading.

All windows shall be of shatter-resistant material.

Means of emergency evacuation of passengers shall be provided.

The maximum capacity of each cabin, both in pounds and kilograms and number of passengers, shall be posted in a conspicuous place in each cabin.

The width of cabin seats shall be at least 18 inches (460 mm) per person. If passengers are to remain standing, floor space of 2.5 square feet (0.232 square meter) per person shall be available. The minimum clear floor space in accessible cabins shall be 48 inches by 30 inches (1220 mm X 760 mm). Where special accessible cabins are used, it is recommended the waiting interval should not exceed 10 minutes.

All carriers shall be clearly identified with numbers located on each end of each carrier.

Semi-open carriers shall meet applicable requirements for enclosed cabins and open chairs.

4.1.4.5.4 Chair safety details.

Prior to May 15, 1999:

Each chair shall be equipped with a railing at each side, to a height of not less than 4 inches (10 cm) above the seat for a distance of not less than 12 inches (30 cm) from the back of the seat.

For aerial lifts operating primarily for foot passengers, each chair shall be equipped with a restraining device that will not open under forward pressure.

4.2.1.1 Applicable codes.

May 15, 2000 to May 15, 2006:

All electrical systems shall comply with 4.2.1.1 Applicable codes of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical systems shall comply with 4.2.1.1 Applicable codes of the B77.1-1992 ANSI Standard.

Nov. 1, 1991 to Jan 1, 1994:

All electrical systems shall comply with 4.2.1.1 Applicable codes of the B77.1-1990 ANSI Standard.

Jan. 1, 1984 to Nov 1, 1991:

All electrical systems shall comply with 4.2.1.1 Applicable codes of the B77.1-1982 ANSI Standard.

Jan 1, 1977 to Jan. 1, 1984:

All electrical work shall comply with 4.2.1.1 Applicable codes of the B77.1-1976 ANSI Standard.

Jan 1, 1974 to Jan. 1, 1977:

All electrical work shall comply with 4.2.1.1 Applicable codes of the B77.1-1973 ANSI Standard.

Jan 1, 1972 to Jan 1, 1974:

All electrical work shall comply with 4.2.1.1 Applicable codes of the B77.1-1970 ANSI Standard.

Prior to Jan 1, 1972:

All electrical work shall comply with 4.2.1.1 Applicable codes of the B77.1-1960 ANSI Standard.

4.2.1.2 Location.

May 15, 2000 to May 15, 2006:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 4.2.1.2 Location of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 4.2.1.2 Location of the B77.1-1992 ANSI Standard.

Nov. 1, 1991 to Jan 1, 1994:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 4.2.1.2 Location of the B77.1-1990 ANSI Standard.

Jan. 1, 1984 to Nov 1, 1991:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 4.2.1.2 Location of the B77.1-1982 ANSI Standard.

Prior to Jan. 1, 1984:

All exposed electrical power transmission wiring shall be so located that in case of collapse or breakage of the power line it will not come into contact with carriers, ropes, or passengers.

4.2.1.3 Protection.

Prior to May 15, 2006:

All transformer stations and other high voltage electrical equipment shall be marked with conspicuous warning signs and shall be protected so as to prevent unauthorized persons from entering the area or coming in contact with any portion of the equipment or wiring. All power equipment shall be protected against overloads by circuit breakers or fuses.

4.2.1.4 Overhead cables.

Prior to May 15, 2006:

Signal, communication, and control circuits may be supported between towers that support the aerial lift. Voltage on overhead or exposed circuits shall be limited to 50 volts with the exception of the intermittent ring-down circuits for telephone systems.

4.2.1.5.5 Ground fault interrupter protection.

Prior to May 15, 2006:

Not required.

4.2.1.6.3 Haul rope grounding.

Jan 1, 1984 to Present:

Grounding sheaves or equivalent means shall be provided at each end of the tramway for the purpose of grounding haul ropes, as applicable, for static electrical discharge. For systems with an isolated or insulated haul rope incorporated in the operating circuitry, no means of grounding are required when the operating circuit takes into consideration static electrical discharge.

Prior to Jan 1, 1984:

Not required.

4.2.2 Electrical system circuit design and classification.

Prior to May 15, 2006:

Not required.

4.2.3.8 Acceleration/deceleration monitoring.

Prior to May 15, 2006:

Not required.

4.2.10 Safety of operating and maintenance personnel.

Prior to May 15, 1999:

The sign "Personnel Working on Lift - Do Not Start" or a similar warning sign shall be hung on the main disconnect switch or at control points for starting the power unit(s) when persons are working on the aerial lift.

Provision shall be incorporated in the ropeway design to render the system inoperable when necessary for the Lock-out Tag-out protection of personnel working on the aerial lift.

4.3.1.2.1 Requirements for signs.

- (a) The design of any sign as well as its support and the installation procedure of such sign shall be considered a minor modification if the sign or aggregate of signs on a given tower is greater than three feet square (nine square feet).
- (b) Signs, fasteners, or supporting members shall not interfere with the operation of the tramway.
- (c) The design of structural components shall be reviewed to consider the increase in loading caused by any sign.
- (d) Signs shall not interfere with passenger or attendant vision.

4.3.1.3 Operational plan for transportation of recreational equipment. Each licensee shall have an operational plan that has procedures for transportation of sports equipment and recreational devices by foot passengers. This plan shall be consistent with the tramway manufacturer's specifications and instructions, if any.

4.3.4.3.1 Acceptance criteria for grips and hangers - minimum requirements. The following shall be considered the minimum requirements for an acceptance criteria.

- (1) Qualifications for testing personnel;
- (2) Sampling size and method of obtaining the sample;
- (3) Allowable rejection rate and retest procedures;
- (4) Types of inspections to be performed and the procedures to be used;
- (5) Criteria for acceptance/rejection of samples;
- (6) Certification from the manufacturer/design engineer that the testing procedures are acceptable to detect faulty materials.

Section 5 Surface lifts

Note: Timeframes relate to the ropeway installation date or modification date whichever controls, unless otherwise noted.

5.1.1.3.4 Location of power lines.

Jan. 1, 1977 to Present:

Power lines shall be located a minimum distance equal to the height of poles or support structures from any passenger tramway so that poles and electrical lines cannot touch any portion of the tramway, loading or unloading points or platforms and tow path, if applicable, upon collapse of poles or lines, unless suitable and approved precautions are taken to safeguard human lives.

5.1.1.3.5 Air space requirements.

5.1.1.3.5.1 Structures.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

May 15, 2000 to Present:

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by vertical planes commencing at a point thirty-five (35) feet from the intersection of the vertical planes of the ropes or cables and ground surface.

For purposes of this rule, buildings controlled by the licensee used primarily for maintenance and operation of the lift and other tramways shall not be considered structures; however, buildings must comply with the following.

- (1) No flammable liquids may be stored in the building outside of a UL listed container or storage cabinet, unless such flammable liquids are in the original containers and intended for daily usage. Quantities must be consistent with normal daily use. Class I or II flammable storage materials shall be limited to 2 gallons in a UL listed container and must be stored either in an outside storage area or in a UL listed cabinet.
- (2) The building must be within the view of the attendant but not impair the sight line of the lift.
- (3) Entrances to all machinery, operators', and attendants' rooms shall be locked when not in use. Unattended entrances accessible to public, which may be left open, shall be equipped with barriers to prevent entry.

Jan. 1, 1994 to May 15, 2000:

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by planes having an outward slope of one horizontal and two vertical and commencing at a point twenty (20) feet horizontally outside of the intersection of the vertical planes of ropes or cables and ground surface

Dec. 30, 1977 to Jan. 1, 1994:

No passenger tramway installation shall be permitted whenever the Passenger Tramway Operator does not have permanent and irrevocable control of the following air space (except when the passenger tramway is located on Forest Service land): the area bounded by planes having an outward slope of one horizontal and two vertical and commencing at a point twenty (20) feet horizontally outside of the intersection of the vertical planes of ropes or cables and ground surface

Prior to Dec. 30, 1977:
Not required

5.1.1.3.5.2 Cables or ropes.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

May 15, 2000 to Present:

Any cable or rope installed on or near a ropeway that may represent a hazard to the ropeway shall be monitored to automatically stop the ropeway if the cable or rope fails. Failure would be defined as per Section 23.1 (g).

EXCEPTION: Track or haul ropes are excluded from this rule.

Prior to May 15, 2000:
Not required

5.1.1.5.2 Clearances.

Prior to Dec. 31, 1977:

A minimum clearance of 36 inches shall be maintained between the base of the tower and the vertical plane of the upward traveling cable. With respect to the downward traveling cable, a minimum clearance of 24 inches shall be provided between towing outfit in its normal position and the tower. This paragraph is not to be construed as preventing the authority having jurisdiction from requiring larger minimum clearances, at its discretion. A definite need for additional clearances arises when it is proposed to transport more than two skiers per towing outfit.

5.1.2.8.2 Haul rope terminal sheaves (Bullwheel and deflection sheaves):

Haul rope terminal sheave frames shall be designed to retain the rope in the event of the failure of the sheave, shaft, or mounting. In instances where the sheave is cantilevered, the design working stresses shall not be more than 60% of those otherwise allowable.

The minimum diameter of terminal sheaves shall be 72 times the nominal diameter of the haul rope. The sheave assembly shall be designed to retain the haul rope in the event of a deropement from the sheave. A flange extension of 1-½ times the rope diameter (measured from the bottom of the rope groove) shall be deemed adequate for retention.

Haul rope terminal sheaves that act as driving, braking, or holding sheaves shall be so designed tht the haul rope does not slip in the sheave groove. The design coefficient of friction for a particular sheave liner shall not exceed the following values:

<u>Sheave Liner</u>	<u>Coefficient of Friction</u>
Steel or cast iron grooves	0.070
Leather	0.150
Rubber, neoprene, or other	0.205

5.1.3.1 Towers.

Prior to Nov. 1, 1991:

The design of the tower structure and foundation shall be in accordance with the requirements of 5.1.1.6. Where guyed towers are used and guys intersect the ground within or near ski runs, the guys shall be marked for visibility.

Means shall be provided for ready access from the ground to all tower tops. Permanent ladders are required for heights above those accessible by portable ladders.

Portable ladders, if used, shall be in at least sufficient quantity to be available at each point where attendants are positioned. Portable ladders extending more than 20 feet (6.10 meters) shall not be used.

Towers shall be identified with successive numbers clearly visible to passengers.

Where towers are designed to permit variations in rope height, sheave unit supports shall be guided and attached so as to prevent misalignment by rotation

5.2.1.1 Applicable codes.

May 15, 2000 to May 15, 2006:

All electrical systems shall comply with 5.2.1.1 Applicable codes of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical systems shall comply with 5.2.1.1 Applicable codes of the B77.1-1992 ANSI Standard.

Nov. 1, 1991 to Jan 1, 1994:

All electrical systems shall comply with 5.2.1.1 Applicable codes of the B77.1-1990 ANSI Standard.

Jan. 1, 1984 to Nov 1, 1991:

All electrical systems shall comply with 5.2.1.1 Applicable codes of the B77.1-1982 ANSI Standard.

Jan 1, 1977 to Jan. 1, 1984:

All electrical work shall comply with 5.2.1.1 Applicable codes of the B77.1-1976 ANSI Standard.

Jan 1, 1974 to Jan. 1, 1977:

All electrical work shall comply with 5.2.1.1 Applicable codes of the B77.1-1973 ANSI Standard.

Jan 1, 1972 to Jan 1, 1974:

All electrical work shall comply with 5.2.1.1 Applicable codes of the B77.1-1970 ANSI Standard.

Prior to Jan 1, 1972:

All electrical work shall comply with 5.2.1.1 Applicable codes of the B77.1-1960 ANSI Standard.

5.2.1.2 Location.

May 15, 2000 to May 15, 2006:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 5.2.1.2 Location of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 5.2.1.2 Location of the B77.1-1992 ANSI Standard.

Nov. 1, 1991 to Jan 1, 1994:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 5.2.1.2 Location of the B77.1-1990 ANSI Standard.

Jan. 1, 1984 to Nov 1, 1991:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 5.2.1.2 Location of the B77.1-1982 ANSI Standard.

Prior to Jan. 1, 1984:

All exposed electrical power transmission wiring shall be so located that in case of collapse or breakage of the power line it will not come into contact with carriers, ropes, or passengers.

5.2.1.3 Protection.

Prior to May 15, 2006:

All transformer stations and other high voltage electrical equipment shall be marked with conspicuous warning signs and shall be protected so as to prevent unauthorized persons from entering the area or coming in contact with any portion of the equipment or wiring. All power equipment shall be protected against overloads by circuit breakers or fuses.

5.2.1.4 Overhead cables.

Prior to May 15, 2006:

Signal, communication, and control circuits may be supported between towers that support the aerial lift. Voltage on overhead or exposed circuits shall be limited to 50 volts with the exception of the intermittent ring-down circuits for telephone systems.

5.2.1.5.5 Ground fault interrupter protection.

Prior to May 15, 2006:

Not required.

5.2.2 Electrical system circuit design and classification.

Prior to May 15, 2006:

Not required.

5.2.10 Safety of operating and maintenance personnel.

Prior to May 15, 2006:

The sign "Personnel Working on Lift - Do Not Start" or a similar warning sign shall be hung on the main disconnect switch or at control points for starting the power unit(s) when persons are working on the aerial lift.

Provision shall be incorporated in the ropeway design to render the system inoperable when necessary for the Lock-out Tag-out protection of personnel working on the aerial lift.

5.3.1.2.1 Requirements for signs.

- (a) The design of any sign as well as its support and the installation procedure of such sign shall be considered a minor modification if the sign or aggregate of signs on a given tower is greater than three feet square (nine square feet).
- (b) Signs, fasteners, or supporting members shall not interfere with the operation of the tramway.
- (c) The design of structural components shall be reviewed to consider the increase in loading caused by any sign.
- (d) Signs shall not interfere with passenger or attendant vision.

5.3.1.3 Operational plan for transportation of recreational equipment. Each licensee shall have an operational plan that has procedures for transportation of sports equipment and recreational devices by foot passengers. This plan shall be consistent with the tramway manufacturer's specifications and instructions, if any.

Section 6 Tows

Note: Timeframes relate to the ropeway installation date or modification date whichever controls, unless otherwise noted.

6.1.1.3.3 Location of power lines.

Jan. 1, 1977 to Present:

Power lines shall be located a minimum distance equal to the height of poles or support structures from any passenger tramway so that poles and electrical lines cannot touch any portion of the tramway, loading or unloading points or platforms and tow path, if applicable, upon collapse of poles or lines, unless suitable and approved precautions are taken to safeguard human lives.

6.1.1.3.4 Air space requirements.

6.1.1.3.4.1 Structures.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

May 15, 2000 to Present:

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by vertical planes commencing at a point thirty-five (35) feet from the intersection of the vertical planes of the ropes or cables and ground surface.

For purposes of this rule, buildings controlled by the licensee used primarily for maintenance and operation of the lift and other tramways shall not be considered structures; however, buildings must comply with the following.

- (1) No flammable liquids may be stored in the building outside of a UL listed container or storage cabinet, unless such flammable liquids are in the original containers and intended for daily usage. Quantities must be consistent with normal daily use. Class I or II flammable storage materials shall be limited to 2 gallons in a UL listed container and must be stored either in an outside storage area or in a UL listed cabinet.
- (2) The building must be within the view of the attendant but not impair the sight line of the lift.
- (3) Entrances to all machinery, operators', and attendants' rooms shall be locked when not in use. Unattended entrances accessible to public, which may be left open, shall be equipped with barriers to prevent entry.

Jan. 1, 1994 to May 15, 2000:

No passenger tramway installation shall be permitted to operate when a structure encroaches into the air space of the passenger tramway, defined as the area bounded by planes having an outward slope of one horizontal and two vertical and commencing at a point twenty (20) feet horizontally outside of the intersection of the vertical planes of ropes or cables and ground surface

Dec. 30, 1977 to Jan. 1, 1994:

No passenger tramway installation shall be permitted whenever the Passenger Tramway Operator does not have permanent and irrevocable control of the following air space (except when the passenger tramway is located on Forest Service land): the area bounded by planes having an outward slope of one horizontal and two vertical and commencing at a point twenty (20) feet horizontally outside of the intersection of the vertical planes of ropes or cables and ground surface

Prior to Dec. 30, 1977:
Not required

6.1.1.3.4.2 Cables or ropes.

Note: Timeframes stated for this rule define the air space requirements for each ropeway at the time when the encroachment was known to the area and DO NOT pertain to the installation date of the ropeway.

May 15, 2000 to Present:

Any cable or rope installed on or near a ropeway that may represent a hazard to the ropeway shall be monitored to automatically stop the ropeway if the cable or rope fails. Failure would be defined as per Section 23.1 (g).

EXCEPTION: Track or haul ropes are excluded from this rule.

Prior to May 15, 2000:
Not required

6.2.1.1 Applicable codes.

May 15, 2000 to May 15, 2006:

All electrical systems shall comply with 6.2.1.1 Applicable codes of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical systems shall comply with 6.2.1.1 Applicable codes of the B77.1-1992 ANSI Standard.

Nov. 1, 1991 to Jan 1, 1994:

All electrical systems shall comply with 6.2.1.1 Applicable codes of the B77.1-1990 ANSI Standard.

Jan. 1, 1984 to Nov 1, 1991:

All electrical systems shall comply with 6.2.1.1 Applicable codes of the B77.1-1982 ANSI Standard.

Jan 1, 1977 to Jan. 1, 1984:

All electrical work shall comply with 6.2.1.1 Applicable codes of the B77.1-1976 ANSI Standard.

Jan 1, 1974 to Jan. 1, 1977:

All electrical work shall comply with 6.2.1.1 Applicable codes of the B77.1-1973 ANSI Standard.

Jan 1, 1972 to Jan 1, 1974:

All electrical work shall comply with 6.2.1.1 Applicable codes of the B77.1-1970 ANSI Standard.

Prior to Jan 1, 1972:

All electrical work shall comply with 6.2.1.1 Applicable codes of the B77.1-1960 ANSI Standard.

6.2.1.2 Location.

May 15, 2000 to May 15, 2006:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 6.2.1.2 Location of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 6.2.1.2 Location of the B77.1-1992 ANSI Standard.

Nov. 1, 1991 to Jan 1, 1994:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 6.2.1.2 Location of the B77.1-1990 ANSI Standard.

Jan. 1, 1984 to Nov 1, 1991:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 6.2.1.2 Location of the B77.1-1982 ANSI Standard.

Prior to Jan. 1, 1984:

All exposed electrical power transmission wiring shall be so located that in case of collapse or breakage of the power line it will not come into contact with carriers, ropes, or passengers.

6.2.1.3 Protection.

Prior to May 15, 2006:

All transformer stations and other high voltage electrical equipment shall be marked with conspicuous warning signs and shall be protected so as to prevent unauthorized persons from entering the area or coming in contact with any portion of the equipment or wiring. All power equipment shall be protected against overloads by circuit breakers or fuses.

6.2.1.4 Overhead cables.

Prior to May 15, 2006:

Signal, communication, and control circuits may be supported between towers that support the aerial lift. Voltage on overhead or exposed circuits shall be limited to 50 volts with the exception of the intermittent ring-down circuits for telephone systems.

6.2.1.5.5 Ground fault interrupter protection.

Prior to May 15, 2006:

Not required.

6.2.2 Electrical system circuit design and classification.

Prior to May 15, 2006:

Not required.

6.3.1.2.1 Requirement for signs.

- (a) The design of any sign as well as its support and the installation procedure of each sign shall be considered a minor modification if the sign or aggregate of signs on a given tower is greater than three feet square (nine square feet).
- (b) Signs, fasteners, or supporting members shall not interfere with the operation of the tramway.
- (c) The design of structural components shall be reviewed to consider the increase in loading caused by any sign.
- (d) Signs shall not interfere with passenger or attendant vision.

6.3.1.3 Operational plan for transportation of recreational equipment. Each licensee shall have an operational plan that has procedures for transportation of sports equipment and recreational devices by foot passengers. This plan shall be consistent with the tramway manufacturer's specifications and instructions, if any.

Section 7 Conveyors

Note: Timeframes relate to the ropeway installation date or modification date whichever controls, unless otherwise noted.

7.2.1.1 Applicable codes.

May 15, 2000 to May 15, 2006:

All electrical systems shall comply with 8.2.1.1 Applicable codes of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical systems shall comply with 6.2.1.1 Applicable codes of the B77.1-1992 ANSI Standard.

7.2.1.2 Location.

May 15, 2000 to May 15, 2006:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 8.2.1.2 Location of the B77.1-1999 ANSI Standard.

Jan. 1, 1994 to May 15, 2000:

All electrical power transmission wiring located near or proposed to cross over aerial lifts shall comply with 6.2.1.2 Location of the B77.1-1992 ANSI Standard.

7.2.1.3 Protection.

Prior to May 15, 2006:

All transformer stations and other high voltage electrical equipment shall be marked with conspicuous warning signs and shall be protected so as to prevent unauthorized persons from entering the area or coming in contact with any portion of the equipment or wiring. All power equipment shall be protected against overloads by circuit breakers or fuses.

7.2.1.5.5 Ground fault interrupter protection.

Prior to May 15, 2006:

Not required.

7.2.2 Electrical system circuit design and classification.

Prior to May 15, 2006:

Not required

7.2.3.3 Belt transition device.

Prior to May 15, 2006:

A belt transition stop device shall be provided. If an object continues to follow the belt past the belt transition stop device, the device shall move to relieve the pinch point and initiate the stop.

As a minimum, the belt transition stop device shall have the following features:

a) The leading edge of the device shall be marked with yellow and black warning stripes.

Exception: If the tramway utilizes rollers for the transition device, the yellow and black stripes are not required;

b) reserved

c) a stop shall be initiated by a force on the transition device not to exceed 30 pounds (133 newtons). The activating force shall be applied tangentially to the belt surface at the leading edge of the belt transition stop device. See Figure 7-1, ANSI 2006;

d) reserved

e) the distance between the belt surface and the belt transition device shall be minimized in the normal operating position;

f) the stop shall be initiated before the leading edge of the device moves 5/8 inch (15 mm) in the direction of its travel;

g) if the belt transition stop device is activated, the conveyor belt must stop within a belt travel distance of 12 inches (305 mm). At no time may the stopping distance be greater than ½ of the circumference of the drum;

h) if an object becomes entangled between the conveyor belt and the belt guard, the guard shall move to relieve the pinch point and initiate the stop. The guard shall be capable of moving the lesser of 5 inches (125 mm) or 150% of the distance required to stop the empty conveyor belt operating at full speed.

Section 8 Reserved

Section 9 Funiculars (ANSI B77.2-2004)

2.1.1.8 Fuel tanks for combustion engines. This rule is superceded by ANSI B77.1-2006 Annex F Combustion engine(s) and fuel handling.

Section 10 Reserved

Section 11 Reserved

Section 12 Reserved

Section 13 Reserved

Section 14 Reserved

Section 15 Reserved

Section 16 Reserved

Section 17 Reserved

Section 18 Reserved

Section 19 Reserved

Section 20 Tramway licensing

20.1 License required. A passenger tramway not in compliance with these rules and regulations may be licensed if it has been granted the necessary exceptions pursuant to Section 1.2.3. Terms, conditions or requirements limiting any license may be imposed if reasonably necessary to effect compliance with these rules and regulations or to protect the safety of the public.

20.2 Issuance of license. No license applied for shall be issued by the Board until it has received a letter from the area's designated agent or appointed substitute designee stating that all the deficiencies listed in the inspection report have been corrected and the authority appointed by the Board has corroborated such letter. Such corroboration may be made by review of the above verified letter; subsequent inspection; the Board's own investigation; the receipt of additional documentation requested by the Board; or any other means which the Board or appointed authority deems appropriate. Such letter shall bear a recognizable signature, printed name, and title and be submitted as an original or transmitted by electronic means. The certificate shall be issued as soon as possible, but no later than seven (7) days after receipt of such letter, unless the Board has reasonable grounds to delay issuance and has given notice of such action and its reasons to the area operator affected prior to expiration of such seven (7) day period. The license, or copy thereof, shall be displayed prominently at the place where passengers are loaded.

20.3 Expiration of licenses. Tramways are licensed during the fall licensing period or the spring licensing period as designated by the Board for one calendar year.

1. The **fall** licensing period shall be prior to the winter operating season.
2. The **spring** licensing period shall be prior to the summer operating season.

If the tramway is closed, the requirements of X.3.3 Maintenance must be current before the tramway can reopen for public operation. Licenses shall expire one calendar year from the date of issue.

Section 21 New installations and modifications

21.1 Definitions.

21.1.1 New installation. "New Installation" means any passenger tramway installation not previously licensed and shall include both new and relocated passenger tramways (also reference rules 1.2.4.1 and 1.2.4.2).

21.1.2 Major tramway modification. "Major Tramway Modification" means any modification to a passenger tramway which alters its verified design or verified construction and which results in a substantive change:

- (a) in design speed of the system; or
- (b) in capacity by changing the number of carriers, spacing of carriers, or load capacity of carriers; or
- (c) in the path of the rope; or
- (d) in the type of brakes and/or backstops or components thereof; or
- (e) in structural arrangements; or
- (f) in power or type of prime mover or auxiliary engine; or
- (g) to control system logic.

Design and construction verifications are required. A major tramway modification may be deemed a new installation by the Board and current requirements shall be applicable (reference rule 1.2.4.3).

21.1.3 Minor modification. "Minor Modification" means any modification, addition, or deletion to a passenger tramway which does not meet the criteria of a major modification but which results in a significant change in the tramway's verified design or verified construction and materially affects its integrity, operation or control. A design verification is required, however, no construction verification is required. A minor modification may be considered a major modification at the discretion of the Board. If the authority appointed by the Board disagrees with the classification of the modification as "minor", the matter may be referred to the Board for a final decision.

21.1.4 Minor alteration. "Minor Alteration" means any other addition or deletion to a passenger tramway which does not meet the criteria of a major or minor modification or one for one replacement, and which does not materially affect the tramway's integrity, operation or control. No design or construction verification is required. A minor alteration may be considered a minor modification or a major modification at the discretion of the Board.

21.1.5 One for one replacement. "One for One Replacement" means the replacement of a component with an equal component. A one for one replacement shall be considered as normal maintenance and not as a modification. No design or construction verification is required.

21.2 Procedures prior to public operation for new and relocated installations.

21.2.1 Submittal of notice of new or relocated installation. Before construction of the new or relocated installation begins, the area operator shall give notice of such activity to the Board on the required forms and include the appropriate fee.

21.2.2 Acknowledgment of new or relocated installation. Upon receipt of the notice, the Board shall send an acknowledgment of such to the area operator together with the appropriate forms and requirements to complete the procedure as set forth in these rules and regulations.

21.2.3 Submittal of request for exception. If the area operator proposes to depart from these rules and regulations, a request for exception must be made in writing by the area operator as set forth in rule 1.2.3.

21.2.4 Exception request procedure. Within thirty (30) days after receipt of the request for exception as provided for in 21.2.3, the Board shall notify the area operator in writing of its action on the requested exception. If the Board denies or limits the requested exception, the Board's notification shall set forth the reasons for such action. Within sixty (60) days of the mailing of such notification, the area operator may appeal the Board's decision as provided for in Article 4 of Title 24 of the Colorado Revised Statutes.

21.2.5 Submittal of verification of design. Before construction of the new installation is begun, the Professional Engineer in responsible charge of the design shall verify to the Board on the appropriate forms that the passenger tramway design conforms to all rules and regulations of the Board. Copies of such designs, plans and specifications shall be submitted with this written verification.

21.2.6 Submittal of acceptance test request. Acceptance tests will be scheduled by the Board on a first come, first served basis. At least thirty (30) days before a requested acceptance test, the area operator shall notify the Board of a projected date for the required acceptance test. Upon receipt of such notification the Board shall establish a tentative acceptance test date for such passenger tramway and shall notify the area operator of the same. If the projected date changes the area operator shall immediately notify the Board of same, and the Board shall reschedule the acceptance test. No later than three (3) days before the date of the acceptance test, the area operator shall notify the Board that the passenger tramway is completed and ready for testing. The area operator shall verify to the Board that the required hours of continuous operation have been accomplished in accordance with 2.1.1.11.2 or 3.1.1.11.2 or 4.1.1.11.2. Upon receipt of such timely notifications, the initial inspection and acceptance test shall proceed as scheduled.

21.2.7 Submittal of acceptance test procedure. At least thirty (30) days before the scheduled acceptance test date, the area operator shall submit an acceptance test procedure which was prepared by the Professional Engineer in responsible charge of the design (see 2.1.1.11, 3.1.1.11, 4.1.1.11, 5.1.1.11, 6.1.1.11, 8.1.1.11, or 2.1.1.11 ANSI B77.2-2004) for approval by the Board or the authority appointed by the Board.

21.2.8 Submittal of verification of construction. After the new installation or relocation is completed and before the initial inspection is conducted, and before the acceptance test is observed, the Professional Engineer in responsible charge of the tramway construction shall verify to the Board on the appropriate form that the foundations, soils and concrete test samples have been inspected and completed according to the design, plans and specifications for such work. This document shall be required prior to the acceptance test.

21.2.9 Submittal of as-built drawings and additional documents. Prior to or during the acceptance test, the "As-Built" designs, plans, specifications and drawings signed and sealed by the design engineer shall be submitted to the Board.

Within thirty (30) days after the acceptance test, the authority appointed by the Board shall notify the area operator of any additional documents which must be submitted.

21.2.10 Inspection and acceptance test. All inspections and acceptance tests shall be according to these rules and regulations. Items failing to pass the acceptance test shall be retested if so directed by the Board.

21.2.11 Submittal of verification of initial inspection and acceptance test. The Board inspector shall report to the Board the results of the Acceptance Test and any deficiencies.

21.3 Procedures prior to public operation for tramways with major tramway modifications. In addition to the applicable requirements of Section 20 and rule 1.2, the following procedure shall be completed prior to public operation of the passenger tramway.

21.3.1 Submittal of notice of modification. Before the major tramway modification commences, the area operator shall give notice of such activity to the Board on the required forms and include the appropriate fee.

21.3.2 Acknowledgment of major tramway modification. Upon receipt of the notice, the Board shall send an acknowledgment of such to the area operator together with the appropriate forms and requirements to complete the procedure as set forth in these rules and regulations.

21.3.3 Submittal of request for exception. If the area operator proposes to depart from these rules and regulations, a request for exception must be made in writing by the area operator as set forth in rule 1.2.3.

21.3.4 Exception request procedure. Within thirty (30) days after receipt of the request for exception as provided for in 21.3.3, the Board shall notify the area operator in writing of its action on the request. If the Board denies or limits the requested exception, the Board's notification shall set forth the reasons for such action. The area operator may appeal the Board's decision as provided for in Article 4 of Title 24 of the Colorado Revised Statutes.

21.3.5 Submittal of verification of design. Before construction of the major tramway modification is begun, the Professional Engineer in responsible charge of the design of the tramway major modification shall verify to the Board on the appropriate forms that the design, plans and specifications for the major tramway modification conforms to all rules and regulations of the Board and is compatible with the existing tramway design. Copies of such designs, plans and specifications shall be submitted with this written verification.

21.3.6 Submittal of acceptance test request. Acceptance tests will be scheduled by the Board on a first come, first served basis. At least thirty (30) days before a requested acceptance test, the area operator shall notify the Board of a projected date for the acceptance test. Upon receipt of such notification, the Board shall establish a tentative acceptance test date for such passenger tramway and shall notify the area operator of the same. If the projected date changes, the area operator shall immediately notify the Board of same and the Board shall reschedule the acceptance test. No later than three (3) days before the date of the acceptance test, the area operator shall notify the Board that the passenger tramway modification is completed and ready for testing.

21.3.7 Submittal of acceptance test procedure. At least thirty (30) days before the scheduled acceptance test date, the area operator shall submit an acceptance test procedure which was prepared by the Professional Engineer in responsible charge of the design of the major tramway modification for approval by the Board or the authority appointed by the Board. The acceptance test procedure shall take into consideration the modification which was made to the passenger tramway and should be tailored to test the critical components of said modification.

21.3.8 Submittal of verification of construction. After the major tramway modification is completed and before the initial inspection is conducted and before the acceptance test is observed, the Professional Engineer in responsible charge of the construction of the modification shall verify to the Board on the appropriate form that the construction and/or installation of the modification has been completed according to the design, plans and specifications for such work. This document shall be required prior to the acceptance test.

21.3.9 Submittal of as-built drawings and additional documents. Prior to or during the acceptance test, the "As-Built" designs, plans, specifications and drawings signed and sealed by the design engineer shall be submitted to the Board.

Within thirty (30) days after the acceptance test, the authority appointed by the Board shall notify the area operator of any additional documents which must be submitted.

21.3.10 Inspection and acceptance test. All inspections and acceptance tests shall be according to these rules and regulations. Items failing to pass the acceptance test shall be retested if so directed by the Board.

21.3.11 Submittal of verification of initial inspection and acceptance test. The Board inspector shall report to the Board the results of the Acceptance Test and any deficiencies.

21.4 Procedures for tramways with minor modifications.

21.4.1 Submittal of notice of modification. Before the minor modification commences, the area operator shall give notice of such activity to the Board on the required forms.

21.4.2 Acknowledgment of minor modification. Upon receipt of the notice, the Board shall send an acknowledgment of such to the area operator together with the appropriate forms and requirements to complete the procedure as set forth in these rules and regulations.

21.4.3 Documentation of minor modifications. The area operator shall keep a log documenting all minor modifications made to each of its passenger tramways. Such log shall be readily available for inspection by the Board or designated representatives of the Board and shall contain at a minimum the following information:

- (a) tramway name or other means of identification;
- (b) name of design engineer;
- (c) verification of design engineer on form approved by the Board;
- (d) date of modification;
- (e) purpose of modification;
- (f) description of modification;
- (g) names of personnel performing such modification;
- (h) date of modification review and acceptance by area operator or its authorized agent.

Each area operator's log of minor modifications shall be readily available to the Board's inspectors during every inspection.

21.5 Documentation of minor alterations. The area operator shall keep a log documenting all minor alterations made to each of its passenger tramways. Such log shall be readily available for inspection by the Board or designated representatives of the Board and shall contain at a minimum the following information:

- (a) tramway name or other means of identification;
- (b) date of alteration;
- (c) purpose of alteration;
- (d) description of alteration;
- (e) names of personnel performing such alteration;
- (f) date of alteration review and acceptance by area operator or its authorized agent.

Each area operator's log of minor alterations shall be readily available to the Board's inspectors during every inspection.

Section 22 Inspections

22.1 Duty of the area operator. It is the primary responsibility of the area operator to perform such inspections on passenger tramways that are necessary to protect the safety of the public.

22.2 Duty of the board. The Board may cause to be made such inspections of passenger tramways as it may reasonably require and may require the area operators to keep such records, make such tests, and produce such evidence as may be necessary in order to make the following determinations:

- (a) compliance with these rules and regulations and C.R.S. 25-5, Part 7;
- (b) compliance with any terms, conditions and requirements of licensure;
- (c) compliance with any requirements of a granted exception (variance);
- (d) inspection disclosed no unreasonable safety hazard.

22.3 Required inspections.

22.3.1 Annual licensing inspection. The annual licensing inspection shall be made prior to approval of any application for licensure.

22.3.2 Annual unannounced inspection.

(1) In addition to the annual licensing inspection, an unannounced inspection of every passenger tramway shall be made at least once a year during the high-use season. No passenger tramway shall be shut down for an unannounced inspection during normal operating hours, unless sufficient daylight is not available for the inspection. Up to five tramway stops, not to exceed three (3) minutes in the aggregate, may be ordered by an inspector during normal operating hours. If additional stop time is required, it shall be done before or after normal operating hours.

Notwithstanding the provisions of this subsection, the Board reserves the authority to order a shutdown of a passenger tramway for any reason set forth in these rules and regulations or in the Act.

(2) The inspector conducting the annual unannounced inspection shall take particular note of any deficiencies noted in the annual licensing inspection report. The inspector shall note any uncorrected deficiencies in the inspection report. Any uncorrected deficiencies noted in the prior inspection may be grounds for revocation or suspension of license.

22.3.3 Acceptance test inspection. All new tramways, tramways on which major tramway modifications have been performed, and tramways which have not been operated for routine maintenance within the previous 2 years shall have an acceptance test inspection in accordance with 21.2.10 and 21.3.10.

22.3.3.1 Acceptance test inspection during operating season. Tramways that require relocation or a major modification during the tramway's operational season shall have an acceptance test inspection in accordance with 21.2.10 and 21.3.10.

22.3.4 Special inspections. In addition to the annual licensing and unannounced inspection of each passenger tramway, the Board may order such special inspections as it may require.

If events are warranted, this determination can be made for the Board by the Board Chair **and** the Supervisory Tramway Engineer. In the event that the Board Chair does not have technical experience with tramways, another Board member with such experience may assist the Chair in the evaluation. If the Board or its designees determine that an unreasonable hazard requiring emergency shutdown exists, procedures set forth in § 25-5-716, C.R.S. shall be followed.

Depending on the circumstances, the Board may reasonably require special procedures and conditions to be followed, including but not limited to, the following:

- (a) that such special inspections be unannounced;
- (b) that the inspection be conducted by a person other than a regular inspector employed by the Board when special expertise is required;
- (c) that, in appropriate cases, the area operator conduct the inspection;
- (d) that the inspection be completed in a time frame as specified by the Board;
- (e) that the results of the inspection shall be communicated to the Board office within the time period set forth in the inspection order;
- (f) that the ropeway be shut down during the inspection and that the inspection be completed before the public is allowed to ride, or continue to ride, the ropeway.

Inspection orders shall be in writing. Service of inspection orders shall be made by delivering it to the area operator or the area operator's agent by handing it to such person, leaving it at the person's office with a clerk or other person in charge, or mailing it to the person's last known address. Service by mail is complete on mailing.

22.3.5 Additional required inspection. In addition to the annual licensing and unannounced inspections for each passenger tramway, there may be additional required inspections after each 2000 hours of operation.

22.4 Inspection procedures for annual licensing and unannounced inspections.

22.4.1 Inspection of equipment. The inspector employed by the Board shall conduct a visual and audible inspection. The inspection shall determine whether any item of equipment does not appear to be in proper working order.

The inspector is not required to conduct specialized testing or inspection of devices which can only be accomplished by persons with special expertise, but the inspector shall recommend to the Board that further, specialized inspections be conducted if either visual and audible inspection, review of the relevant records and documents, or presentation of any other evidence reasonably indicates that such an inspection is warranted.

22.4.2 Inspection of records and other documents.

(1) The inspector, employed by the Board, shall reasonably review the required logs, manuals, test reports of required self inspections, and manufacturer's recommended operation and maintenance manuals.

(2) If the logs and records required by these rules and regulations or by order of the Board are not properly kept, the inspector shall so advise the Board in writing. If any of the documents to be inspected exist, but are not present for the inspection, the inspector shall not certify the passenger tramway being inspected to the Board for licensure until he has had an opportunity to review such documents.

22.4.3 Other areas of inspection. The Board shall determine whether the area operator has established a reasonable training program for its operation and maintenance personnel and whether practices reasonably necessary for safe operations are being followed.

22.4.4 Inspection report. Upon completion of the inspection, the inspector shall provide the area operator of the passenger tramway(s) being inspected, or his agent, with a copy of the preliminary report of observations made during the inspection. As soon as possible, but no later than fifteen (15) days after the completion of the inspection, the inspector shall transmit to the Board a final report. This report shall include a statement as to whether it reasonably appears to the inspector that the passenger tramway(s) inspected comply with the statutes, these rules and regulations, and any other applicable orders of the Board, and that the inspection of such passenger tramway(s) disclosed no unreasonable safety hazards.

For each passenger tramway inspected, the inspector shall list the items not in compliance with these rules and regulations. The area operator of the passenger tramway(s) inspected shall also receive a copy of the inspector's final report.

Deficiencies stated in the annual inspection report shall be remedied as set forth in section 20.2.

Deficiencies stated in the annual unannounced inspection report and in any additional required inspection report(s) shall be remedied. A letter from the area's designated agent or appointed substitute designee stating that all the deficiencies listed in the inspection report have been corrected, must be received by the Board office within twenty-eight (28) days from the completion of the inspection. Such letter shall bear a recognizable signature, printed name, and title and be submitted as an original or transmitted by electronic means.

Deficiencies stated in an acceptance test report(s) as required in 22.3.3.1 shall be remedied. A letter from the area's designated agent or appointed substitute designee stating that all the deficiencies listed in the inspection report have been corrected, must be received and acknowledged by the Board office before the tramway can open for public operation. Such letter shall bear a recognizable signature, printed name, and title and be submitted as an original or transmitted by electronic means.

The inspection completion date shall be noted on both the preliminary and final inspection report.

22.4.5 Report of unreasonable hazard. If the inspector finds a condition in the passenger tramway construction, operation or maintenance, logs, records or other documents (including the absence of these documents) exists which may endanger the safety of the public, the inspector shall immediately notify the area operator, or his agent, in writing, to this effect at the time of the inspection. The inspector shall also issue an immediate report to the Board for appropriate investigation and order. In the event that any of the documents required to be inspected or the lack thereof indicates that a violation of the Board's rules and regulations exists, or that a condition in passenger tramway construction, operation, and maintenance exists, either of which may endanger the safety of the public, the inspector shall not certify the passenger tramway being inspected to the Board for licensure. Additionally, an immediate report shall be made to the Board for appropriate investigation and order.

22.5 Qualified inspectors.

22.5.1 General inspectors. All required inspections as listed in Rule 22.3 in these rules and regulations shall be conducted by qualified engineers who shall have demonstrated to the Board's satisfaction that they have a working knowledge of the Board's current rules and regulations and inspection procedures.

22.5.2 Inspector conflict of interest. No person, except a full-time employee of the Board, shall observe an acceptance test or conduct an inspection of a passenger tramway if:

- (a) during the past two (2) years the inspector has been an employee of the owner or area operator of the tramway; or,
- (b) the inspector was involved at any level of the design, construction or modification of any tramway at that area in the past five years; or,
- (c) the inspector provided any other services to that area in the past five years.

Each year, prior to July 1st, each contract inspector shall make known all potential conflicts of interest on appropriate forms provided by the Board.

Inspectors shall disclose all known and potential conflicts of interest, business association or other circumstances that could influence their judgment or the quality of their inspections each year prior to July 1st on appropriate forms provided by the Board. Should any conflicts arise during the year, the inspector is obligated to report them to the Board staff immediately.

This policy is not intended per se to prohibit employees or members of an inspector's firm or company from doing work for an area operator, provided that disclosures of potential conflict are made and that appropriate measures are in place to ensure that the inspector is not involved in, or privy to, information concerning the work.

Section 23 Passenger tramway incidents

23.1 Definitions.

"Reportable passenger tramway incident" is defined as the following.

(a) Any incident from a possible malfunction of a passenger tramway in which a person is injured or killed. The tramway shall cease operation as defined by Section 23.3 Limitation of operation.

For the purposes of Section 23, the term "injured" is defined as bodily damage requiring immediate medical attention.

(b) Any incident in which a passenger is injured falling or jumping from a chair which is outside of the load or unload zone.

For the purposes of this rule, the "load zone" is defined as the area from the "wait here" sign to a point where the "no ski closure" ends or in the event there are no ski closures, at a point where the vertical clearance of the lift line is greater than eight (8) feet. This is measured from the bottom of the chair seat of an open carrier to the terrain or snow surface.

For the purposes of this rule, the "unload zone" is defined is the area approaching the unload area where the vertical clearance is less than eight (8) feet. This is measured from the bottom of an open carrier to the terrain or snow surface.

(c) Any unintentional deropement of an aerial tramway regardless of whether or not the tramway is evacuated. This does not apply to Surface Lifts, Tows and Conveyors.

(d) Any unplanned evacuation other than by prime mover or auxiliary power unit, regardless of cause. This does not apply to Surface Lifts, Tows and Conveyors.

(e) Any fire involving tramway equipment or structures that poses a risk to passengers, operating personnel or the structural integrity of the tramway.

(f) Failure of any electrical or mechanical component which results in the loss of control of the tramway, unless the loss of control is a direct result of the malfunction of a single manual stop or speed control switch. Any of the following five (5) conditions is considered a loss of control:

- (1) tramway will not slow down when given the command to do so;
- (2) tramway will not stop when given the command to do so;
- (3) tramway accelerates faster than normal design acceleration;
- (4) tramway self starts or self accelerates without the command to do so;
- (5) tramway reverses direction unintentionally and without the command to do so.

(g) The failure of the following components or their primary connections are reportable:

Failure is defined as the inability of the listed components to continue to function as designed and continued operation would represent a hazard.

- (1) Terminal Structure;
- (2) Bullwheel;
- (3) Brake System Components;
- (4) Tower Structure;
- (5) Sheave, Axle or Sheave Assembly;
- (6) Carrier;
- (7) Grip;
- (8) Haul, Track or Counterweight Cable.

23.2 Reporting to the board.

(a) All reportable passenger tramway incidents occurring during public operation shall be orally reported to a Board member or the authority appointed by the Board as soon as reasonably possible but no later than twenty-four (24) hours after the time of such incident or within twenty-four (24) hours after the incident becomes known to the area personnel. A written report shall be delivered to the Board on forms approved by the Board postmarked within five (5) days of such incident or postmarked within five (5) days after the incident becomes known to the area personnel.

(b) A reportable incident discovered on dates when the lift is not open to the public shall be orally reported to a Board member or the authority appointed by the Board as soon as reasonably possible, but no later than seventy-two (72) hours after such incident becomes known to the area personnel. A written report shall be delivered to the Board on forms approved by the Board or postmarked within fifteen (15) days following the verbal report. However, all oral reports must be made prior to reopening a lift.

Area personnel is defined as personnel involved with the operation, supervision and maintenance of the tramway. This includes, but is not limited to, lift maintenance, lift operations, ski patrol and all supervisory staff.

23.3 Limitation of operation. When a death or injury results from a possible malfunction of a passenger tramway, as defined in Section 23.1 (a), the owner or area personnel of the tramway shall immediately cease operation and notify the Supervisory Tramway Engineer or a member of the Board by telephone. No part of the tramway shall be removed or disturbed before permission has been given by a Board member, the Supervisory Tramway Engineer, or his designated representative, except to the extent that such action is necessary to avoid further death or serious injury.

An investigation of the occurrence shall then be initiated within 24 hours and shall precede any authorization to resume public operation of the tramway. The report of investigation shall include a factual account of the incident, the nature and extent of injuries to persons, damage to the passenger tramway, any witness statements, any other pertinent details, and recommendations for remedial measures to be taken prior to resuming operation.

23.4 Logs - components. Area operators shall maintain a log in a format approved by the Board which shall contain reports of components replaced or repaired that do not meet the definitions of CPTSB section 23.1(g) and are not part of maintenance due to normal wear. These reports shall be submitted during public operation to the Board at monthly intervals not to exceed 60 days from the date of occurrence. When the lift is not open to the public, the Component Log shall be submitted on a monthly basis when routine maintenance is being performed.

This log shall be available for inspection and, if requested by the Board or its duly authorized representative, the area operator shall make copies available of the relevant records relating to any of the components.

23.5 Logs – stoppages. Area operators shall maintain a passenger tramway log which shall contain reports of all passenger tramway stoppages over ten (10) minutes. For each such stoppage, the log shall contain the following information:

- (a) name and/or number of the passenger tramway;
- (b) date of stoppage;
- (c) reason for stoppage;
- (d) description of any mechanical, structural, electrical, or other problem (if known);
- (e) under investigation (yes or no);
- (f) action taken, if any;
- (g) length of time the tramway was down.

This log shall be available for inspection and, if requested by the Board or its duly authorized representative, the area operator shall make copies available of the relevant records relating to any of the stoppages.

23.6 Logs - loading, unloading incidents and passengers falling or jumping from lifts. Area operators shall maintain a log which shall contain reports of all loading and unloading incidents in which injury occurs. This log shall also contain any incident in which a passenger falls or jumps from a chair with no injury, of which the area personnel has knowledge, that is outside the load or unload zone. For the purposes of this rule, the "load zone" and "unload zone" is defined in 23.1(b).

For each such loading and unloading incident, the log shall contain the following information:

- (a) name and/or number of the passenger tramway;
- (b) date the incident occurred;
- (c) name, address and age of person injured;
- (d) description of the injury;
- (e) description of the incident;
- (f) under investigation (yes or no).

For each such fall or jumping incident, the log shall contain the following information:

- (a) name and/or number of the passenger tramway;
- (b) date the incident occurred;
- (c) age and gender of person involved, if known;
- (d) location of incident;
- (e) under investigation (yes or no).

This log shall be available for inspection and, if requested by the Board or its duly authorized representative, the area operator shall make copies available of the relevant records relating to any of the incidents.

Section 24 Rules of board procedure.

24.1 Declaratory orders.

24.1.1 Basis of declaratory orders. Any person may petition the board for a Declaratory Order to terminate controversies or to remove uncertainties as to the applicability to the petitioner of any statutory provision or of any rule or order of the board.

24.1.2 Board discretion in considering petitions. The board will determine, in its discretion and without notice to petitioner, whether to rule upon any such petition. If the board determines that it will not rule upon such a petition, the board shall promptly notify the petitioner of its action and state the reasons for such action.

24.1.3 Basis of board consideration of petitions. In determining whether to rule upon a petition filed pursuant to this rule, the board will consider the following matters, among others.

(a) Whether a ruling on the petition will terminate a controversy or remove uncertainties as to the applicability to the petitioner of any statutory provision or rule or order of the board.

(b) Whether the petition involves any subject, question, or issue that is the subject of a formal or informal matter of investigation currently pending before the board or a court involving one or more of the petitioners.

(c) Whether the petition involves any subject, question, or issue that is the subject of a formal or informal matter or investigation currently pending before the board or a court but not involving any petitioner.

(d) Whether the petition seeks a ruling on a moot or hypothetical question or will result in an advisory ruling or opinion.

(e) Whether the petitioner has some other adequate legal remedy, other than an action for declaratory relief pursuant to Rule 57, Colorado Rules of Civil Procedure, that will terminate the controversy or remove any uncertainty as to the applicability to the petitioner of the statute, rule or order in question.

24.1.4 Requirements of petitioner. Any petition filed pursuant to this rule shall set forth all of the following.

(a) The name and address of the petitioner and whether the petitioner is licensed pursuant to Section 12-25-101 et seq. or Section 12-25-201 et seq., C.R.S.

(b) The statute, rule, or order to which the petition relates.

(c) A concise statement of all of the facts necessary to show the nature of the controversy or uncertainty and the manner in which the statute, rule, or order in question applies or potentially applies to the petitioner.

24.1.5 Applicable procedures. If the board determines that it will rule on the petition, the following procedures shall apply.

(a) The board may rule upon the petition based solely upon the facts presented in the petition. In such a case, the following applies.

(i) Any ruling of the board will apply only to the extent of the facts presented in the petition and any amendment to the petition.

(ii) The board may order the petitioner to file a written brief, memorandum, or statement of position.

(iii) The board may set the petition, upon due notice to the petitioner, for a non-evidentiary hearing.

(iv) The board may dispose of the petition on the sole basis of the matters set forth in the petition.

(v) The board may request the petitioner to submit additional facts, in writing. In such event, such additional facts will be considered as an amendment to the petition.

(vi) The board may take administrative notice of facts pursuant to the Administrative Procedures Act (Section 24-4-105(8), C.R.S.) and may utilize its experience, technical competence, and specialized knowledge in the disposition of the petition.

(vii) If the board rules upon the petition without a hearing, it shall promptly notify the petitioner of its decision.

(b) The board may, in its discretion, set the petition for hearing, upon due notice to petitioner, for the purpose of obtaining additional facts or information or to determine the truth of any facts set forth in the petition or to hear oral argument on the petition. The notice to the petitioner setting such hearing shall set forth, to the extent necessary, that the petitioner shall have the burden of proving all of the facts stated in the petition, all of the facts necessary to show the nature of the controversy or uncertainty and the manner in which the statute, rule, or order in question applies or potentially applies to the petitioner, and any other facts the petitioner desires the board to consider.

24.1.6 Parties to the proceeding. The parties to any proceeding pursuant to this rule shall be the board and the petitioner. Any other person may seek leave of the board to intervene in such a proceeding, and leave to intervene will be granted at the sole discretion of the board. A petition to intervene shall set forth the same matters as required by Rule 24.1.4. Any reference to a "petitioner" in this rule also refers to any person who has been granted leave to intervene by the board.

24.1.7 Standing of declaratory orders. Any Declaratory Order or other order disposing of a petition pursuant to this rule shall constitute an agency action subject to judicial review pursuant to Section 24-4-106, C.R.S.

Annex E

(Normative)

Operator control devices

Table E-1 – Device function and characteristics

FUNCTION	COLOR	LABEL	FEATURES
Normal Stop	RED	STOP	Mushroom actuator with a minimum diameter of 1-3/8 inches (38 mm)
Emergency Shutdown	RED	EMERGENCY SHUTDOWN	Actuator must be visible but shielded to prevent inadvertent operation. <i>Exception: Shield is not required if the circuit is the only stop circuit on the ropeway.</i>
Start	GREEN	START	
Slow Speed	YELLOW	SLOW	
Medium Speed	BLUE	MEDIUM	
Other Functions (Fast, Reset, Acknowledge, etc.)	<i>ANY COLOR OTHER THAN LISTED ABOVE</i>	THE APPROPRIATE FUNCTION	

Annex F Combustion engine(s) and fuel handling

F.3.1 (c) Evacuation power unit.

Prior to December 2, 2002:

Not required.

F.4.1 Structural members used as fuel tanks.

Prior to October 15, 2001:

Not required.

F.4.4 Outside aboveground or underground fuel supply tanks.

Prior to October 15, 2001:

Not required.

F.4.6 Provisions for internal corrosion.

Prior to October 15, 2001:

Not required.

F.4.7.3 Supply tanks.

Prior to October 15, 2001:

Not required.

F.4.10.11 Fill pipes.

Prior to October 15, 2001:

Not required.

Annex G Welded link chain

G.1.1 Chain Specifications.

Prior to May 15, 2006:
Not required.

G.1.2 Breaking strength.

Prior to May 15, 2006:
Not required.

G.1.3 Test procedures.

Prior to May 15, 2006:
Not required.

G.1.4 Chain test reports.

Prior to May 15, 2006:
Not required.

APPENDIX A

List of Sections Affected

The following is a list of rules, which are new or have been revised or deleted since the last publication of these rules and regulations (May 15, 2010).

Deleted Rules

None

New Rules

None

Revised Rules

Section 3 Detachable grip aerial lifts

APPENDIX B
POLICY STATEMENTS
TABLE OF CONTENTS

<i>Section</i>	<i>Subject</i>	<i>Page</i>
1.	Submission of drawings for new installations or modifications	B-3
2.	Designated agent	B-3
3.	Incident reporting	B-3
4.	Acceptance test guidelines	B-4
5.	Authorities information exchange	B-4
6.	Sublease of tramways	B-4
7.	Guidelines for issuing subpoenas	B-5
8.	Guidelines for acceptance of complimentary day lift tickets or individual ride tickets by board members, staff members and inspectors	B-5
9.	Clarification of modifications list	B-6
10.	Technical committee	B-11
11.	Board staff review of new construction or modification submissions	B-12
12.	Self Reporting of Conditions not in Compliance	B-12
13.	Condition for Personnel During Ropeway Operations	B-12
14.	Unannounced inspection response timeframe	B-14
15.	Inspection Deficiencies not correctable in a timely manner.	B-14
16.	Non-Destructive Inspection (NDI) Indications and Reporting Guidelines	B-14
17.	Anonymous Complaints	B-15

18.	Delegation of Authority to Program Director	B-15
19.	Initial Decision Procedural Order	B-15

APPENDIX B

Policy Statements

1. Submission of drawings for new installations or modifications. It is the policy of the Board that the notice of a new installation or a modification, together with the preliminary plans be in the CPTSB office two weeks in advance of the beginning of any construction activity. By preliminary plans, the Board means the footing design, the profile, and the drawings showing clearances.

2. Designated agent. It is the policy of the Board that each licensee shall authorize and designate an agent, who shall receive service from and sign all documents required by the Board. Said agent shall be, or be an individual appointed by:

- the owner when the licensee is a sole proprietorship;
- an officer of the corporation when said licensee is a corporation;
- a partner when said licensee is a partnership;
- a board or a managing member when said licensee is a limited liability company;
- a board when said licensee is a homeowners' association;
- a city or town manager when said licensee is a municipality or parks and recreation department.

The Board shall be notified in writing at the time of application for registration of the identity of said agent and that said agent shall be in the upper level management of the licensee's organization. The appointed designated agent will be responsible for the licensee's compliance with the Board rules and regulations and disseminating pertinent Board information to the licensee's organization. Any change of an agent during the licensing period shall be made by written notice to the Board and shall be effective upon receipt by the Board.

A designated agent may appoint a substitute designee to act only in circumstances when the designated agent is unavailable. The substitute designee shall not function as an "alternate" to the designated agent when both are available. The Board shall be notified in writing by the designated agent when a substitute designee is appointed and the appointment shall be effective upon receipt by the Board. The substitute designee's appointment shall be limited to a period of one year. Each subsequent year, the designated agent shall notify the Board in writing of the substitute designee's reappointment or appoint another substitute designee. If notification is not received in a subsequent year, the Board shall not recognize a substitute designated agent as having authority to act in the absence of the designated agent. Said substitute designee shall be employed in the upper level management of the area's organization.

3. Incident reporting. One of the legislative mandates to the CPTSB is to, "...prevent unnecessary mechanical hazards in the operation of ski tows, lifts, and tramways..." in order to assist in safeguarding life, health, property, and the welfare of this state. One way in which the CPTSB is attempting to fulfill this mandate is through the fostering of communication among lift manufacturers, area operators, regulatory agencies and the public. One means of communication is the reporting of incidents as outlined by Section 23 of the CPTSB Rules and Regulations. It is the position of the CPTSB that the purpose of reporting is to document incidents, or potential incidents, that may indicate a specific concern to area operators, etc., or which could endanger the public. It is not the intent of the Board to require the reporting of intentional acts

which are the result of operator or maintenance activities (i.e. a practice evacuation drill). It is the intention of the Board to document and disseminate information regarding reportable incidents and other items which have been voluntarily submitted to the Board and to encourage communication among lift manufacturers, area operators, and regulatory agencies regarding these incidents. It is the philosophy of the Board that the timely reporting of incidents and the dissemination of this information will assist in the prevention of unnecessary mechanical hazards as mandated by state statutes.

4. Acceptance test guidelines.

Definition. Acceptance test is the inspection of a new, relocated, or modified (major tramway modification) tramway, which occurs prior to the tramway opening to the public after it has been installed or modified.

Type of inspection. The acceptance test may be conducted in conjunction with the Annual Licensure Inspection or as a special inspection depending upon the time of year the work is completed.

Procedures. Acceptance test procedures shall be prepared by the design engineer and submitted to the Board as required by CPTSB rules 21.2.7 and 21.3.7. This procedure shall meet the requirements of CPTSB rules 21.2.6, 21.3.6, and referenced sections.

Time frame for acceptance test. The acceptance test will be performed prior to public operation and after the tramway or modification to a tramway is completed and fully operational. The necessary verification and submittals must be on file in the Board office prior to the acceptance test.

Acceptance test guidelines. Acceptance test procedures will be written and submitted to the Board by the engineer in responsible charge. The procedure shall demonstrate that all features of the tramway or tramway modifications are in proper working order, have been properly adjusted, and will support the design loads (in compliance with the plans and specifications of the designer).

On site. The licensee will designate one person to coordinate with the CPTSB inspector. The designee shall be responsible for conducting the test(s). The CPTSB inspector will witness the procedure. Other entities (i.e. Forest Services, insurance companies) may observe the acceptance test, however, any questions or concerns these observers may have must be addressed to the area designee.

5. Authorities information exchange. It is the policy of the Colorado Passenger Tramway Safety Board that its members, staff and representatives participate, and encourage others to participate, in ITTAB, NAATO, RMLA and other tramway safety organizations, and that they promote on a voluntary basis the exchange of information between state and federal authorities having jurisdiction concerning technical developments and safety related issues.

6. Sublease of tramways. Any area operator of a passenger tramway who owns, manages, or directs operation of a passenger tramway, may apply to the Board for the annual licensure of the tramway.

The tramway, once licensed to said area operator, shall remain licensed in the name of said area operator for the year term of the license, unless the licensed area operator is completely divested of all rights, titles, and interests of said tramway, at which time the licensed area operator shall immediately apply to the Board for licensure.

Should said tramway be leased or sub-leased to a party other than the licensed area operator, the licensure and all accompanying duties and responsibilities shall remain the responsibility of the licensed operator. (Adopted June 22, 1983)

7. Guidelines for issuing subpoenas. The Program Director will have the authority to issue a subpoena on behalf of the Board under any of the following circumstances.

- a. Apparent failure of an operator to comply with the Board's reporting requirements as set forth in the CPTSB rules and regulations.
- b. Failure of an operator to produce documents which are required to be available to the Board, as set forth in the CPTSB rules and regulations.
- c. Failure of an operator to produce, when requested, the names, addresses and phone numbers of witnesses to a passenger tramway accident or incident under investigation by the Board.

If the Program Director issues an administrative subpoena pursuant to these guidelines, a copy of the subpoena will be sent/faxed to all Board members so they are aware the action was taken.

8. Guidelines for acceptance of complimentary day lift tickets or individual ride tickets by board members, staff members, and inspectors. The Colorado Passenger Tramway Safety Board believes it is essential for Board members, staff, and inspectors to have first hand knowledge of passenger tramway equipment and the unique operation of each of its licensees. The Board, therefore, believes it is appropriate to encourage its members, staff, and inspectors to visit licensees and interact with various passenger tramway institutions and area operators in order to become familiar with the variety of passenger tramways licensed by the Board and the people who work with those tramways.

To that end, Board members, staff, and inspectors may accept occasional complimentary day lift tickets or individual ride tickets from area operators under the following circumstances:

1. Acceptance of a ticket shall be for educational or other Board business that constitutes either:
 - a) CPTSB official business; or
 - b) Familiarization with new equipment, technology or operating procedures; or
 - c) Meeting with licensees to observe and learn about their operations and to learn more about the people who are responsible for tramways.
2. All Board members, staff members, or inspectors accepting complimentary tickets while acting in an official Board sanctioned capacity shall meet with the designated agent, the substitute designated agent, or another area representative whose responsibilities are relevant to Board issues during all such visits. Appropriate prior notice of such visits shall be made to the area.
3. All complimentary day lift tickets or individual ride tickets obtained shall be for the sole use of Board members, staff members, and inspectors. Transfer of such tickets to family members or friends is prohibited.

4. This policy shall be reviewed annually prior to each winter operating season with Board members, staff, and inspectors to emphasize its importance.

Nothing in this policy shall be construed to limit Board members, staff, or inspectors from visiting licensees in their other capacities (e.g. manufacturer's representative, area representative, consultant, consumer, etc.).

9. Clarification of modifications list.

CLARIFICATION OF MAJOR MODIFICATIONS

A major modification is defined as a significant change to the tramway's certified design or certified construction and materially affects the tramway's integrity, operation or control (see rule 21.1.2). The following list is intended to provide guidance in determining those changes to the tramway that are properly classified as major modifications, however, this list is not all inclusive and it must be recognized that the circumstances pertaining to a particular modification may justify reclassification to another category. Therefore, it is the responsibility of the area operator to exercise sound judgment and to consult the Board if further clarification is needed.

All Major Modifications require an acceptance test (see rule 21.3.7) and shall be completed prior to public operation of the passenger tramway. A CPTSB Inspector shall be present during each acceptance test (see rule 22.5.1).

a) A change in the design speed of the system.

1. Any increase beyond certified design.

Note: A decrease is not a major modification.

b) A change in design capacity by changing the number of carriers, spacing of carriers, or load capacity of carriers.

1. Carriers may be added or removed to accommodate normal rope stretch or relocation in rope splice area.

Note: If this is done within the certified design parameters, it is not a modification.

2. Increasing load capacity is interpreted to mean changing the number of passengers (i.e. double chair to triple chair).

Note: A change in carrier spacing which results from normal operation (i.e. grip slippage) is not a modification.

c) A change in the path of the rope.

1. Adding or removing midway load/unload terminal.
2. Moving a tower.
3. Change in tower height or number of towers.

4. Change in line gauge.

5. Moving a terminal is at a minimum a major modification and may be considered a relocation of the lift upon Board review.

d) A change in the type of brakes and/or backstops or components thereof.

1. A change to the application mechanism, defined as the energy used to set brake (i.e. weights to springs, springs to hydraulics, or different types of weights, springs or hydraulics, etc.).

Note: If the specifications of the component are equivalent, then it is treated as a one for one replacement and not a major modification.

e) A change in structural arrangements.

1. A change to the cross arm (i.e. removing angle brace and making it self supporting).

2. Tower.

3. Terminal support.

f) A change in power transmission equipment or type of prime mover or auxiliary engine.

1. An increase or decrease in the horsepower of an electric motor or internal combustion engine.

2. Changing an AC to DC or vice versa, etc.

3. Changing an internal combustion engine to electric or vice versa.

4. A change to the arrangement of the following power transmission equipment - gearbox, fluid coupling, torque converter, V-Belt drive, pulleys, U-joints, shaft couplings (i.e. fluid coupling to torque converter, V-Belt to gear box, etc.).

Note: A change in electric motor or internal combustion engine with equivalent specifications is treated as a one for one replacement and not a major modification.

g) A change in critical components as outlined in rule 1.4.

1. A change in specifications of the critical components.

2. A change from center pole to bail chairs.

3. A change in grip models or manufacturers.

4. Adding chair bubbles, change in type of carrier (i.e. quad chair to gondola).

h) Substantive change to the control system logic.

1. Replacement of the control system.

2. Changing from relay logic to digital.
3. Multiple component changes within system controls.

CLARIFICATION OF MINOR MODIFICATIONS

A minor modification is defined as a modification, addition or deletion to a tramway that alters the tramway's certified design or certified construction (see rule 21.1.3). The following list is intended to provide guidance in determining those changes to the tramway that are properly classified as minor modifications, however, this list is not all inclusive and it must be recognized that the circumstances pertaining to a particular modification may justify reclassification to another category. Therefore, it is the responsibility of the area operator to exercise sound judgment and to consult the Board if further clarification is needed.

a) A repair or reinforcement of structural components including structural portions of critical components. This is to exclude wire rope and wire rope repair. Refer to Section 7.

1. Welding or adding reinforcement steel on bullwheels.
2. Adding gussets to carriers.
3. Repair of dented tower tube caused by snowcat.

b) A change in configuration of tower machinery.

1. Changing in number of sheaves on sheave assembly.
2. Change from support or depression to a combination sheave assembly.

c) Substantive change to component systems within the main controls (all system modifications shall utilize an acceptance test by a qualified engineer to verify system changes and performance and the test results shall be documented).

1. Adding test circuitry (i.e. zone masking or brake testing).
2. Upgrades in the low voltage control system.
3. Change to an anti-collision system.
4. Change to the rope position detectors.
5. Change to motor controller run command and feedback.
6. Change to rope speed feedback.

d) Substantive change to the motor controller drive system (all system modifications shall utilize an acceptance test by a qualified engineer and the test results shall be documented).

1. An upgrade to or a change from analog to digital drives where the control logic remains the same with drives of equivalent or similar performance specifications.

Note: Those that are not equivalent or similar are considered a major modification.

e) Other.

1. Changing type of deropement switches on all towers (i.e. break fork to proximity).
2. Any addition or deletion to carriers after the initial acceptance test, which are not considered one-for-one replacements.
3. Changing chair seat type (i.e. plastic to metal).
4. Changing chair guides (i.e. moving guidage contact from stem to bail, lengthening chair bail).
5. Weighting carriers.
6. Increasing size or addition of communication lines.
7. Change in roll back detection devices (i.e. whisker switch to photo eye; mechanical switch to photo eye).
8. A change in the type of brake releasing mechanism (i.e. manual to hydraulic).
9. Change in brake plumbing configuration.
10. Moving pump actuator hand pump (i.e. motor room to lift shack or vice versa).
11. A change to type of brake pump (i.e. manual to electric).
12. An addition or change of a supervisory, safety or automatic emergency shutdown circuit.
13. Adding, moving or changing lifting frames, ladders, platforms and catwalks.

CLARIFICATION OF MINOR ALTERATIONS

A minor alteration is defined as any other addition or deletion to a passenger tramway that does not meet the criteria of a major or minor modification or one for one replacement, and that does not materially affect the tramway's integrity, operation or control (see rule 21.1.4). The following list is intended to provide guidance in determining those changes to the tramway that are properly classified as minor alterations, however, this list is not all inclusive and it must be recognized that the circumstances pertaining to a particular alteration may justify reclassification to another category. Therefore, it is the responsibility of the area operator to exercise sound judgment and to consult the Board if further clarification is needed.

a) An addition of control system logic or circuits which does not affect the integrity of the existing control system logic

1. Timing circuit that will not allow pumps to run beyond rated cycle.

2. Adding manually operated bypass circuits.
- b) An addition or change of operating circuits (reference x.2.1.7.1)
1. Addition of down loader safety gate or photo eye.
 2. Changing safety gate switch from limit switch to photo eye.
 3. Addition of normal and emergency switches and speed control.
 4. Adding signaling devices or switches.
 5. Addition or change to manually operated emergency shutdown switches.
- c) Adding, moving or changing personnel access and safety equipment.
1. Machinery guards.
 2. Rotating machinery retainers.
- d) Replacement of a component with an equivalent component whose operating parameters are identical to the original equipment.
1. Communication systems (i.e. phone).
 2. Hydraulic pump.
- e) Removal of a component that is not required by code and is not part of the certified design.
1. Safety gate for downloading because lift is not downloaded lift anymore.

CLARIFICATION OF ONE FOR ONE REPLACEMENT

A one for one replacement is defined as a replacement of a component with an equivalent component (see rule 21.1.5). The following list is intended to provide guidance in determining those changes to the tramway that are properly classified as one for one replacement, however, this list is not all inclusive and it must be recognized that the circumstances pertaining to a particular replacement may justify reclassification to another category. Therefore, it is the responsibility of the area operator to exercise sound judgment and to consult the Board if further clarification is needed.

Replacing:

1. batteries and chargers;
2. sheave and bullwheel liners;
3. bearings/bushings;

4. detach mechanism rails;
5. wear strap on top of chair head;
6. heating, venting, lighting;
7. tires;
8. seat pads, footrest bumpers, etc.

10. Technical committee. Section 25-5-704(1) (h), C.R.S., grants the Board the power to establish a standing technical committee composed of persons with expertise in tramway-related fields to review, as the Board deems necessary, the design, construction, maintenance and operation of passenger tramways and to make recommendations to the Board concerning their findings.

Therefore, the Board has determined that a policy statement shall be adopted to govern the purpose, composition and activities of a standing committee to be known as the "Technical Committee."

- ***Mission of the Technical Committee:*** At the Board's direction, the Technical Committee shall review and make recommendations to the Board on technical issues regarding engineering-related matters affecting the design, construction, operation and maintenance of passenger tramways.
- ***Composition of the Technical Committee:*** The members of the Technical Committee shall be appointed by the Board and shall be comprised of the US Forest Service representative, who shall be a professional engineer, the Supervisory Tramway Engineer, who shall be a professional engineer, two other professional engineers, and two area representatives who shall have substantial experience in the operation and maintenance of passenger tramways.
- ***Term of Service:*** Members of the Technical Committee shall be appointed to two year terms. Appointments shall be staggered to provide for continuity on the Committee. The US Forest Service and the Supervisory Tramway Engineer positions shall be permanent appointees.
- ***Officers:*** The members of the Technical Committee shall elect a Chairperson and Vice-Chairperson annually. The Program Assistant for the Board shall be designated the Secretary of the Technical Committee.
- ***Meetings of the Technical Committee:*** The Technical Committee shall meet at least two weeks prior to scheduled Board meetings and such meetings shall be public.
- ***Record of Proceedings:*** A written record documenting the business conducted by the Technical Committee during its meetings shall be maintained by staff and shall be public.
- ***Reports to the Board:*** The Technical Committee shall report its recommendations to the Board in writing at the next Board meeting and shall provide additional oral comments as the Board may require.

11. Board staff review of new construction or modification submissions. It is the policy of the Colorado Passenger Tramway Safety Board that these submissions should be reviewed, and, if something unusual is found during this review, Board staff has the authority to ask questions of the design engineer and/or request additional information.

12. Self Reporting of Conditions not in Compliance.

In accordance with the Board's stated policy to encourage communication among lift manufacturers, area operators, regulatory agencies and the public, it is the policy of the Board to require an area to report any condition of a passenger tramway which is not in compliance with one or more of the requirements of the Colorado Passenger Tramway Safety Board Rules and Regulations ("CPTSB Rules") and which would require action by the Board for continued operation. A non-compliant condition shall be defined as any condition which does not meet one or more requirements set forth in the CPTSB Rules, but is not a reportable incident defined by Section 23 of the CPTSB Rules and which is determined not to constitute an unreasonable hazard requiring Emergency Shutdown pursuant to § 25-5-716 of the Colorado Revised Statutes ("C.R.S."). If an unreasonable hazard exists in the continued operation of a passenger tramway, the area shall immediately follow procedures for an emergency shutdown pursuant to § 25-5-716 C.R.S.

It is the policy of the Board that a non-compliant condition shall be reported orally or in writing to a Board member, or the authority appointed by the Board, as soon as reasonably possible but no later than twenty-four (24) hours after such condition becomes known to area personnel.

After notification of the non-compliant condition, the Board shall determine if an unreasonable hazard requiring immediate shutdown pursuant to § 25-5-716 C.R.S. exists. This determination will be made for the Board by the Board Chair **and** the Supervisory Tramway Engineer or may be delegated by the Board, or by the Board Chair on behalf of the Board, to the Supervisory Tramway Engineer. In the event that the current Board Chair does not have technical experience with tramways, another Board member with such experience may assist the Chair in the evaluation. If the Board's designees determine an unreasonable hazard requiring emergency shutdown exists, procedures set forth in § 25-5-716 C.R.S. shall be followed.

If no unreasonable hazard is determined to exist the area shall be permitted to operate the lift pending timely resolution of the condition as follows: Within twenty five (25) days after the condition becomes known to area personnel the area shall either notify the Board that it has corrected the condition and come into compliance with all CPTSB Rules, or apply to the Board for a variance as set forth in the Guidelines for Requesting a Variance from the CPTSB. The request for a variance will be considered by the Board at its next regularly scheduled Board meeting.

13. Conditions for Personnel During Ropeway Operations.

Each licensee shall have an operational plan that identifies criteria for pre-operational tramway inspections for the transportation of personnel on aerial ropeways. The criteria for the plan shall be based upon the area's operational experience, a Qualified Engineer, or the tramway manufacturer's specifications for operations and instructions, if any, to reduce the risks for the personnel involved.

Implementation of the procedures intended for the protection of all personnel shall be the responsibility of the area operator, supervisor, and the authorized individual.

The preoperational plan shall include, but not be limited to:

Minimum Requirements

1. At least one brake and stop switch has been operated.
2. One of the following items:
 - a) The ropeway is operated slowly for a minimum of three (3) minutes or a length of time equal to the time a carrier takes to cross the longest span on the installation; or,
 - b) A visual line inspection by trained personnel who shall be in communication with the operator of the ropeway. This inspection may occur while riding the aerial ropeway if the first rider is in constant communication with the operator.
3. The list of personnel authorized by the Designated Agent to approve the transportation of passengers under the three sections below.

The Operational Plan shall have at a minimum, three sections pertaining to the following three types of tramways:

A. Licensed Ropeways

The Operational Plan must define personnel that may be transported prior to the normal pre-operational inspections and the minimum requirements stated above shall be included.

Typically, such personnel are directly related to the operation or maintenance of the tramway or safety related circumstances.

B. Unlicensed Ropeways Subsequent to Initial Testing and Licensing including Expired Licenses

The Operational Plan must define personnel that may be transported prior to the normal pre-operational inspections and the minimum requirements stated above shall be included.

Typically, such personnel are directly related to the operation or maintenance of the tramway or safety related circumstances and are direct employees of the licensee.

C. Unlicensed Ropeways Prior to Testing and Licensing

The Operational Plan must define personnel that may be transported prior to the normal pre-operational inspections and the minimum requirements stated above shall be included.

Only personnel related to the completion of the construction, operation, and buildings directly related to the operation of the tramway may be transported by the tramway during this condition.

14. Unannounced inspection response timeframe. Under CPTSB Rule 22.4.4, the areas have twenty-eight (28) days from the final date of an unannounced inspection in which they must respond to an unannounced inspection report. Of those twenty-eight (28) days, time is included for the mailing/transmitting of the deficiency response letter to the Board office.

15. Inspection Deficiencies not correctable in a timely manner.

All deficiencies cited in inspection reports must be remedied as set forth in CPTSB Rule 20.2 and 22.4.4. However, there may be circumstances in which the area cannot remedy a deficiency in a timely manner under the requirements of the Colorado Passenger Tramway Safety Board Rules and Regulations.

In such cases, after the inspection occurs and the deficiency is discovered the area may report the circumstances regarding the deficiency in writing or orally and the reason it may not be remedied in a timely manner to the Board. After notification is received, the Board shall review the reason the deficiency cannot be corrected, determine if the deficiency would create an unreasonable hazard, and if the tramway(s) could be licensed or continue to be licensed prior to the deficiency being corrected. This determination will be made for the Board by the Board Chair **and** the Supervisory Tramway Engineer or may be delegated by the Board, or by the Board Chair on behalf of the Board, to the Supervisory Tramway Engineer. In the event that the current Board Chair does not have technical experience with tramways, another Board member with such experience may assist the Chair in the evaluation.

If the Board's designees determine that the reason for postponement of correcting the deficiency is valid and that the deficiency would not be an unreasonable hazard, the tramway(s) at issue shall be licensed or shall continue to be licensed pending a timely resolution of the deficiency and the area shall apply to the Board for a variance as set forth in the Guidelines for Requesting a Variance from the CPTSB. The request for a variance shall be considered by the Board at its next regularly scheduled Board meeting.

16. Non-Destructive Inspection (NDI) Indications and Reporting Guidelines.

The following guidelines have been established to clarify the reporting requirements if indications are found during the Non-Destructive Inspection (NDI) of grips, hangers, and carriers.

24 Hour Incident Report Requirement

- **NDI Indication of Component Rejection** – If the NDI indication reveals the component is-rejected by the Manufacturer or Qualified Engineer's criteria, then that NDI indication **IS** reportable using the **24-Hour Incident Report**. This will allow the Board office to watch for trends for failed components (see Board Rules and Regulation-Section 23).

Component Log Requirement

- **NDI Indication Acceptable with Repairs or Rework** - If the NDI indication can be remedied by repair or rework, then the information should be placed on the **Component Log** so the Board office can also follow them and watch for trends between similar components.

No Reporting Action Required

- **NDI Indication Acceptable with no action** - If the NDI indication is determined to be acceptable with no further action by the Area, Manufacturer, or Qualified Engineer, then no reporting is required.

17. Anonymous Complaints.

This policy clarifies the Board's position regarding the consideration of anonymous complaints. It is the policy of the Colorado Passenger Tramway Safety Board to discourage anonymous complaints. Further, the Board will not automatically investigate anonymous complaints. Rather, they will be subject to review by the Board on a case-by-case basis.

18. Delegation of Authority to Program Director.

18a. Investigative Subpoena Enforcement. When, in the course of investigation of a complaint, a subpoena needs to be enforced pursuant to the Passenger Tramway Safety Act or the Administrative Procedure Act, the Colorado Passenger Tramway Safety Board specifically authorizes the Program Director to refer such a matter directly to the Office of the Attorney General for enforcement.

18b. Execution of Board Orders. The Board delegates to the Program Director the authority to sign, on behalf of the Board, the following documents, the terms of which the Board has previously approved: Confidential Letters of Concern, Letters of Admonition, Orders to Show Cause, Cease and Desist Orders, Stipulations and other settlement agreements, and Final Agency Orders. The signature of such documents by the Program Director shall be considered execution by the Board.

19. Initial Decision Procedural Order.

19a. Execution of Board Procedural Orders. The Board delegates to the Program Director, Section Director or their designee the authority to issue, on behalf of the Board, the adopted "Board Procedural Order Regarding Review of Initial Decision" with the directive that the Order be issued to the parties upon receipt of all initial decisions.

19b. Review of Initial Decisions Upon Default. The Board will not review initial decisions upon default where no party files exceptions to the initial decision, in the manner and within the time required by the Colorado Administrative Procedure Act. In those instances, the initial decision shall become the order and final agency action of the Board, in accordance with the Administrative Procedure Act, without further action. The Board delegates to the Program Director, Section Director, or their designee authority to issue, on behalf of the Board, written notice to the parties of the final agency action.

Colorado Revised Statutes

Title 25 Health

Article 5 Products Control and Safety

Part 7 Passenger Tramway Safety

Effective July 1, 2008

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Table of Contents

25-5-701. Legislative declaration.	1
25-5-702. Definitions.	1
25-5-703. Passenger tramway safety board - composition - termination.	2
25-5-703.5. Board subject to termination - repeal of article. (Repealed)	3
25-5-704. Powers and duties of board.	4
25-5-705. Responsibilities of area operators.	5
25-5-706. Disciplinary action - administrative sanctions - grounds.	5
25-5-707. Orders - enforcement.	6
25-5-708. Disciplinary proceedings.	7
25-5-709. Passenger tramway licensing required.	7
25-5-710. Application for new construction or major modification.	7
25-5-711. Application for licensing.	7
25-5-712. Licensing of passenger tramways.	8
25-5-713. Licensing and certification fees.	8
25-5-714. Disposition of fees and fines.	8
25-5-715. Inspections and investigations - costs - reports.	8
25-5-716. Emergency shutdown.	9
25-5-717. Provisions in lieu of others.	10
25-5-718. Governmental immunity - limitations on liability.	10
25-5-719. Independent contractors - no general immunity.	10
25-5-720. Confidentiality of reports and other materials.	10
25-5-721. Repeal of part.	10

25-5-701. Legislative declaration.

In order to assist in safeguarding life, health, property, and the welfare of this state, it is the policy of the state of Colorado to establish a board empowered to prevent unnecessary mechanical hazards in the operation of passenger tramways and to assure that reasonable design and construction are used for, that accepted safety devices and sufficient personnel are provided for, and that periodic inspections and adjustments are made which are deemed essential to the safe operation of, passenger tramways.

25-5-702. Definitions.

As used in this part 7, unless the context otherwise requires:

(1) "Area operator" means a person who owns, manages, or directs the operation and maintenance of a passenger tramway. "Area operator" may apply to the state or any political subdivision or instrumentality thereof.

(1.5) "Board" means the passenger tramway safety board created by section 25-5-703.

(1.7) "Commercial recreational area" means an entity using passenger tramways to provide recreational opportunities to the public for a fee.

(2) "Industry" means the activities of all those persons in this state who own, manage, or direct the operation of passenger tramways.

(3) "License" means the formal, legal, written permission of the board to operate a passenger tramway.

(4) "Passenger tramway" means a device used to transport passengers uphill on skis, or in cars on tracks, or suspended in the air by the use of steel cables, chains, or belts, or by ropes, and usually supported by trestles or towers with one or more spans. "Passenger tramway" includes, but is not limited to, the following devices:

(a) Fixed-grip lifts. "Fixed-grip lift" means an aerial lift on which carriers remain attached to a haul rope. The tramway system may be either continuously or intermittently circulating, and may be either monocable or bicable.

(b) Detachable-grip lifts. "Detachable-grip lift" means an aerial lift on which carriers alternately attach to and detach from a moving haul rope. The tramway system may be monocable or bicable.

(c) Funiculars. "Funicular" means a device in which a passenger car running on steel or wooden tracks is attached to and propelled by a steel cable, and any similar devices.

(d) Chair lifts. "Chair lift" means a type of transportation on which passengers are carried on chairs suspended in the air and attached to a moving cable, chain, or link belt supported by trestles or towers with one or more spans, and any similar devices.

(e) Surface lifts. "Surface lift" means a J-bar, T-bar, or platter pull and any similar types of devices or means of transportation which pull skiers riding on skis by means of

an attachment to a main overhead cable supported by trestles or towers with one or more spans.

(f) Rope tows. "Rope tow" means a type of transportation which pulls the skier riding on skis as the skier grasps the rope manually, and any similar devices.

(g) Portable aerial tramway devices. "Portable aerial tramway device" means any device designed for temporary use and operation, without permanent foundations, in changing or variable locations, with a capacity of less than five persons, which transports equipment or personnel, and is not used or intended to be used by the general public.

(h) Portable tramway devices. "Portable tramway device" means any device designed to be used and operated as a rope tow or surface lift without permanent foundations and intended for temporary use in changing or variable locations, when used within the boundary of a recognized ski area.

(i) Private residence tramways. "Private residence tramway" means a device installed at a private residence or installed in multiple dwellings as a means of access to a private residence in such multiple dwelling buildings, so long as the tramway is so installed that it is not accessible to the general public or to other occupants of the building.

(j) Reversible aerial tramways. "Reversible aerial tramway" means a device on which passengers are transported in cable-supported carriers and are not in contact with the ground or snow surface, and in which the carriers reciprocate between terminals.

(k) Conveyors. "Conveyor" means a type of transportation by which skiers, or passengers on recreational devices, are transported uphill on top of a flexible, moving element such as a belt or a series of rollers.

(4.5) "Program administrator" means the person who manages the board's offices on a day-to-day basis and works with the supervisory tramway engineer and the board in implementing the policies, decisions, and orders of the board.

(5) "Qualified tramway design engineer" or "qualified tramway construction engineer" means an engineer licensed by the state board of licensure for architects, professional engineers, and professional land surveyors pursuant to part 1 of article 25 of title 12, C.R.S., to practice professional engineering in this state.

(6) "Staff" means the program administrator, the supervisory tramway engineer, and their clerical staff.

(7) "Supervisory tramway engineer" means the tramway engineer who works with the program administrator and the board in implementing the policies, decisions, and orders of the board.

25-5-703. Passenger tramway safety board - composition - termination.

(1) There is hereby created a passenger tramway safety board of six appointive members and one member designated by the United States forest service. The appointive members shall be appointed by the governor from persons representing the following

interests: Two members to represent the industry or area operators; two members to represent the public at large; one member who is a licensed professional engineer not employed by a ski area or related industry; and one member familiar with or experienced in the tramway industry who may represent the passenger tramway manufacturing or design industry or an area operator. No person shall be so appointed or designated except those who, by reason of knowledge or experience, shall be deemed to be qualified. Such knowledge or experience shall be either from active and relevant involvement in the design, manufacture, or operation of passenger tramways or as a result of extensive and relevant involvement in related activities. The governor, in making such appointments, shall consider recommendations made to him or her by the membership of the particular interest from which the appointments are to be made.

(2) Each of the appointed members shall be appointed for a term of four years and until a successor is appointed and qualified and no board member shall serve more than two consecutive four-year terms. A former board member may be reappointed to the board after having vacated the board for one four-year term. Vacancies on the board, for either an unexpired term or for a new term, shall be filled through prompt appointment by the governor. The member of the board designated by the United States forest service shall serve for such period as such federal agency shall determine and shall serve without compensation or reimbursement of expenses.

(3) The governor may remove any member of the board for misconduct, incompetence, or neglect of duty.

(4) Board members appointed by the governor shall have been residents of this state for at least three years.

(5) No member of the board who has any form of conflict of interest or the potential thereof shall participate in consideration of the deliberations on matters to which such conflict may relate; such conflicts may include, but are not limited to, a member of the board having acted in any consulting relationship or being directly or indirectly involved in the operation of the tramway in question.

(6) A majority of the board shall constitute a quorum. When necessary, the board may conduct business telephonically during a public meeting for purposes of obtaining a quorum, facilitating the participation of members in remote locations, or both.

(7) The provisions of section 24-34-104, C.R.S., concerning the termination schedule for regulatory bodies of the state unless extended as provided in that section, are applicable to the passenger tramway safety board created by this section.

25-5-703.5. Board subject to termination - repeal of article. (Repealed)

25-5-704. Powers and duties of board.

(1) The board has the following powers and duties in addition to those otherwise described by this part 7:

(a) To promulgate, amend, and repeal such rules as may be necessary and proper to carry out the provisions of this article. In adopting such rules, the board may use as general guidelines the standards contained in the "American National Standard for Passenger Ropeways - Aerial Tramways and Aerial Lifts, Surface Lifts, Tows, and Conveyors - Safety Requirements", as adopted by the American national standards institute, incorporated, as amended from time to time. Such rules shall not be discriminatory in their application to area operators and procedures of the board with respect thereto shall be as provided in section 24-4-103, C.R.S., with respect to rule-making.

(b) To investigate matters relating to the exercise and performance of the powers and duties of the board;

(c) To receive complaints concerning violations of this part 7;

(d) To conduct meetings, hold hearings, and take evidence in all matters relating to the exercise and performance of the powers and duties of the board, subpoena witnesses, administer oaths, and compel the testimony of witnesses and the production of books, papers, and records relevant to the subject inquiry. The program administrator may issue subpoenas on behalf of the board at the board's direction. If any person refuses to obey any subpoena so issued, the board may petition the district court, setting forth the facts, and thereupon the court in a proper case shall issue its subpoena. The board may appoint an administrative law judge pursuant to part 10 of article 30 of title 24, C.R.S., to take evidence and to make findings and report them to the board. The board may elect to hear the matter itself with the assistance of an administrative law judge, who shall rule on the evidence and otherwise conduct the hearing in accordance with the "State Administrative Procedure Act", article 4 of title 24, C.R.S.

(e) To discipline area operators in accordance with this part 7;

(f) To approve and renew licenses in accordance with this part 7;

(g) To elect officers;

(h) To establish standing or temporary technical and safety committees composed of persons with expertise in tramway-related fields to review, as the board deems necessary, the design, construction, maintenance, and operation of passenger tramways and to make recommendations to the board concerning their findings. Committees established pursuant to this paragraph (h) shall meet as deemed necessary by the board or the supervisory tramway engineer.

(i) To collect fees, established pursuant to section 24-34-105, C.R.S., for any application for a new construction or major modification, for any application for licensing, and for inspection and accident investigations;

(j) To cause the prosecution and enjoinder of all persons violating such provisions and to incur the necessary expenses thereof;

(k) To delegate duties to the program administrator;

(l) To keep records of its proceedings and of all applications.

25-5-705. Responsibilities of area operators.

The primary responsibility for design, construction, maintenance, operation, and inspection rests with the area operators of passenger tramway devices.

25-5-706. Disciplinary action - administrative sanctions - grounds.

(1) Disciplinary action of the board pursuant to this section shall be taken in accordance with the "State Administrative Procedure Act", article 4 of title 24, C.R.S.

(2) Disciplinary action of the board may be imposed as an alternative to or in conjunction with the issuance of orders or the pursuit of other remedies provided by section 25-5-707 or 25-5-716, and may consist of any of the following:

(a) Denial, suspension, revocation, or refusal to renew the license of any passenger tramway. The board may summarily suspend a license pursuant to the authority granted by this part 7 or article 4 of title 24, C.R.S.

(b) (I) When a complaint or investigation discloses an instance of misconduct that, in the opinion of the board, does not warrant formal action by the board but that should not be dismissed as being without merit, issuance and sending of a letter of admonition, by certified mail, to the area operator.

(II) When a letter of admonition is sent by the board, by certified mail, to an area operator such area operator shall be advised that he or she has the right to request in writing, within twenty days after receipt of the letter, that formal disciplinary proceedings be initiated to adjudicate the propriety of the conduct upon which the letter of admonition is based.

(III) If the request for adjudication is timely made, the letter of admonition shall be deemed vacated and the matter shall be processed by means of formal disciplinary proceedings.

(c) Assessment of a fine, not to exceed ten thousand dollars per act or omission or, in the case of acts or omissions found to be willful, fifty thousand dollars per act or omission, against any area operator;

(d) Imposition of reasonable conditions upon the continued licensing of a passenger tramway or upon the suspension of further disciplinary action against an area operator.

(3) The board may take disciplinary action for any of the following acts or omissions:

(a) Any violation of the provisions of this part 7 or of any rule or regulation of the board promulgated pursuant to section 25-5-704 when the act or omission upon which the

violation is based was known to, or reasonably should have been known to, the area operator;

(b) Violation of any order of the board issued pursuant to provisions of this part 7;

(c) Failure to report any incident or accident to the board as required by any provision of this part 7 or any rule or regulation of the board promulgated pursuant to section 25-5-704 when the incident or accident was known to, or reasonably should have been known to, the area operator;

(d) Willful or wanton misconduct in the operation or maintenance of a passenger tramway;

(e) Operation of a passenger tramway while a condition exists in the design, construction, operation, or maintenance of the passenger tramway which endangers the public health, safety, or welfare, which condition was known, or reasonably should have been known, by the area operator;

(f) Operation of a passenger tramway by an operator whose license has been suspended;

(g) Failure to comply with an order issued under section 25-5-707 or 25-5-716.

25-5-707. Orders - enforcement.

(1) If, after investigation, the board finds that a violation of any of its rules or regulations exists or that there is a condition in passenger tramway design, construction, operation, or maintenance endangering the safety of the public, it shall forthwith issue its written order setting forth its findings and the corrective action to be taken and fixing a reasonable time for compliance therewith. Such order shall be served upon the area operator involved in accordance with the Colorado rules of civil procedure or the "State Administrative Procedure Act", article 4 of title 24, C.R.S., and shall become final unless the area operator applies to the board for a hearing in the manner provided in section 24-4-105, C.R.S.

(2) If any area operator fails to comply with a lawful order of the board issued under this section within the time fixed thereby, the board may take further action as permitted by sections 25-5-706 and 25-5-716 and may commence an action seeking injunctive relief in the district court of the judicial district in which the relevant passenger tramway is located.

(3) Any person who violates an order issued pursuant to this section shall be subject to a civil penalty of not more than five thousand dollars for each day during which such violation occurs.

(4) Any area operator who operates a passenger tramway which has not been licensed by the board or the license of which has been suspended, or who fails to comply with an order issued under this section or section 25-5-716, commits a class 3 misdemeanor and shall be punished as provided in section 18-1.3-501, C.R.S. Fines collected pursuant to this section shall be deposited in the general fund of the state.

25-5-708. Disciplinary proceedings.

(1) The board may investigate all matters which present grounds for disciplinary action as specified in this part 7.

(2) Disciplinary hearings shall be conducted by the board or by an administrative law judge in accordance with section 25-5-704 (1) (d).

(3) Any person aggrieved by a final action or order of the board may appeal such action to the Colorado court of appeals in accordance with section 24-4-106 (11), C.R.S.

25-5-709. Passenger tramway licensing required.

(1) The state, through the board, shall license all passenger tramways, unless specifically exempted by law, establish reasonable standards of design and operational practices, and cause to be made such inspections as may be necessary in carrying out the provisions of this section.

(2) A passenger tramway shall not be operated in this state unless it has been licensed by the board. No new passenger tramway shall be initially licensed in this state unless its design and construction have been certified to this state as complying with the rules and regulations of the board promulgated pursuant to section 25-5-704. Such certification shall be made by a qualified tramway design engineer or a qualified tramway construction engineer, whichever the case requires.

(3) The board shall have no jurisdiction over the construction of a new private residence tramway or over any modifications to an existing private residence tramway when such tramway is not used, or intended to be used, by the general public.

(4) The board shall have no jurisdiction over a portable aerial tramway device.

(5) The board shall have no jurisdiction over a portable tramway device when such tramway device is not used, or intended to be used, by the general public.

25-5-710. Application for new construction or major modification.

Any new construction of a passenger tramway or any major modification to an existing installation shall not be initiated unless an application for such construction or major modification has been made to the board and a permit therefor has been issued by the board.

25-5-711. Application for licensing.

Each year, every area operator of a passenger tramway shall apply to the board, in such form as the board shall designate, for licensing of the passenger tramways which such area operator owns or manages or the operation of which such area operator directs. The application shall contain such information as the board may reasonably require in order for it to determine whether the passenger tramway sought to be licensed by such area operator complies with the intent of this part 7 as specified in section 25-5-701 and the rules and regulations promulgated by the board pursuant to section 25-5-704.

25-5-712. Licensing of passenger tramways.

(1) The board shall issue to the applying area operator without delay licensing certificates for each passenger tramway owned, managed, or the operation of which is directed by such area operator when the board is satisfied:

(a) That the facts stated in the application are sufficient to enable the board to fulfill its duties under this part 7; and

(b) That each such passenger tramway sought to be licensed has been inspected by an inspector designated by the board according to procedures established by the board and that such inspection disclosed no unreasonable safety hazard and no violations of the provisions of this part 7 or the rules and regulations of the board promulgated pursuant to section 25-5-704.

(2) In order to satisfy itself that the conditions described in subsection (1) of this section have been fulfilled, the board may cause to be made such inspections described in section 25-5-715 as it may reasonably deem necessary.

(3) Repealed.

(4) Licenses shall expire on dates established by the board.

(5) Each area operator shall cause the licensing certificate, or a copy thereof, for each passenger tramway thus licensed to be displayed prominently at the place where passengers are loaded thereon.

25-5-713. Licensing and certification fees.

The application for new construction or major modification and the application for licensing shall be accompanied by a fee established pursuant to section 24-34-105, C.R.S.

25-5-714. Disposition of fees and fines.

(1) All fees collected by the board under the provisions of this part 7 shall be transmitted to the state treasurer, who shall credit the same pursuant to section 24-34-105, C.R.S., and the general assembly shall make annual appropriations pursuant to said section for expenditures of the board incurred in the performance of its duties under this part 7, which expenditures shall be made from such appropriations upon vouchers and warrants drawn pursuant to law.

(2) Fines collected pursuant to section 25-5-707 shall be deposited in the general fund of the state.

25-5-715. Inspections and investigations - costs - reports.

(1) The board may cause to be made such inspection of the design, construction, operation, and maintenance of passenger tramways as the board may reasonably require.

(2) Such inspections shall include, at a minimum, two inspections per year or per two thousand hours of operation, whichever occurs first, of each passenger tramway, one of which inspections shall be during the high use season and shall be unannounced, and shall be carried out under contract by independent contractors selected by the board or by the supervisory tramway engineer. Additional inspections may be required by the board if the area operator does not, in the opinion of the board, make reasonable efforts to correct any deficiencies identified in any prior inspection or if the board otherwise deems such additional inspections necessary. The board shall provide in its rules and regulations that no facility shall be shut down for the purposes of a regular inspection during normal operating hours unless sufficient daylight is not available for the inspection.

(3) The board may employ independent contractors to make such inspections for reasonable fees plus expenses. The expenses incurred by the board in connection with the conduct of inspections provided for in this part 7 shall be paid in the first instance by the board, but each area operator of the passenger tramway which was the subject of such inspection shall, upon notification by the board of the amount due, reimburse the board for any charges made by such personnel for such services and for the actual expenses of each inspection.

(4) The board may cause an investigation to be made in response to an accident or incident involving a passenger tramway, as the board may reasonably require. The board may employ independent contractors to make such investigations for reasonable fees plus expenses. The expenses incurred by the board in connection with the conduct of investigations provided for in this part 7 shall be paid in the first instance by the board, and thereafter one or more area operators may be billed for work performed pursuant to subsection (3) of this section.

(5) If, as the result of an inspection, it is found that a violation of the board's rules and regulations exists, or a condition in passenger tramway design, construction, operation, or maintenance exists, endangering the safety of the public, an immediate report shall be made to the board for appropriate investigation and order.

25-5-716. Emergency shutdown.

When facts are presented tending to show that an unreasonable hazard exists in the continued operation of a passenger tramway, after such verification of said facts as is practical under the circumstances and consistent with the public safety, the board, any member thereof, or the supervisory tramway engineer may, by an emergency order, require the area operator of said tramway forthwith to cease using the same for the transportation of passengers. Such emergency order shall be in writing and signed by a member of the board or the supervisory tramway engineer, and notice thereof may be served by the supervisory tramway engineer, any member of the board, or as provided by the Colorado rules of civil procedure or the "State Administrative Procedure Act", article 4 of title 24, C.R.S. Such service shall be made upon the area operator or the area operator's agent immediately in control of said tramway. Such emergency shutdown shall be effective for a period not to exceed seventy-two hours from the time of service. The board shall conduct an investigation into the facts of the case and shall take such action under this part 7 as may be appropriate.

25-5-717. Provisions in lieu of others.

The provisions for regulation, registration, and licensing of passenger tramways and the area operators thereof under this part 7 shall be in lieu of all other regulations or registration or licensing requirements, and passenger tramways shall not be construed to be common carriers within the meaning of the laws of this state.

25-5-718. Governmental immunity - limitations on liability.

The board, any member of the board, any person on the staff of the board, any technical advisor appointed by the board, any member of an advisory committee appointed by the board, and any independent contractor hired to perform or acting as a state tramway inspector on behalf of the board with whom the board contracts for assistance shall be provided all protections of governmental immunity provided to public employees by article 10 of title 24, C.R.S., including but not limited to the payment of judgments and settlements, the provision of legal defense, and the payment of costs incurred in court actions. These protections shall be provided to the board, board members, staff, technical advisors, committee members, and independent contractors hired to perform or acting as a state tramway inspector on behalf of the board only with regard to actions brought because of acts or omissions committed by such persons in the course of official board duties.

25-5-719. Independent contractors - no general immunity.

The provisions of section 25-5-718 shall be construed as a specific exception to the general exclusion of independent contractors hired to perform or acting as a state tramway inspector on behalf of the board from the protections of governmental immunity provided in article 10 of title 24, C.R.S.

25-5-720. Confidentiality of reports and other materials.

(1) Reports of investigations conducted by an area operator or by a private contractor on an area operator's behalf and filed with the board or the board's staff shall be presumed to be privileged information exempt from public inspection under section 24-72-204 (3) (a) (IV), C.R.S., except as may be ordered by a court of competent jurisdiction.

(2) Except as otherwise provided in subsection (1) of this section, all information in the possession of the board's staff and all final reports to the board shall be open to public inspection in accordance with part 2 of article 72 of title 24, C.R.S.

25-5-721. Repeal of part.

(1) This part 7 is repealed, effective July 1, 2019.

(2) Prior to such repeal, the passenger tramway safety board shall be reviewed as provided for in section 24-34-104, C.R.S.