

Passenger Ropeway Program

Program Overview Manual



Document Number: MAN-4012-01
Date: December 20, 2006

Table of Contents

Introduction	2
Services	4
Safety Manager	4
Safety Officers	5
Licences	5
Certificates of Qualifications	6
Product Approvals	6
Installation Permits	7
Operating Permits	7
Inspections	8
Investigating Incidents	9
Technical Input	10
Variances	10
Equivalent Standards Agreements	11
Safety Management Plans	11
Accessibility and Communications	11
Other Services	12
Resources	13
Clients and Stakeholders	14
Future Growth	15
Revision History	16
Approval	16



Passenger Ropeway Program

Introduction

With its mountains and seasonal activities, British Columbia is known for its tourism and entertainment. Millions of people visit the many ski areas throughout the province, and not just for skiing or snowboarding, but for general sightseeing. Resort owners know the importance of staying open all year round to tourists and the public in order to be successful.

It is therefore necessary for the Passenger Ropeway Program to oversee the safety of all passenger ropeways in the province and that they are installed, operated, and maintained safely and in accordance with the regulatory requirements.

The program is to provide safety services and to do so, the Safety Manager and Safety Officers apply consistent standards by enforcing the *Safety Standards Act*, the *Safety Standards General Regulation*, and the *Elevating Devices Safety Regulation*. In addition, with respects to all of the program's activities, any decision made by a Safety Officer may be reviewed by a Safety Manager upon the request of a client. If the client is not satisfied with the review, the client has the right to appeal the decision to the Safety Standards Appeal Board, which is independent of the BC Safety Authority.

A passenger ropeway is a device that uses a haul rope or other flexible element that is driven by a non-portable power unit to carry, pull, or push passengers along a leveled or inclined pathway. Typically, these would include ski lifts and aerial tramways. Hell's Gate Airtram and the Grouse Mountain Skyride are prime examples of aerial tramways. Passenger ropeways are also used for access to telecommunication towers because access by helicopter is not always possible. The regulation classifies the following devices as a passenger ropeway:

- Passenger conveyors
- Platter lifts
- Fibre and wire rope tows
- Single or double reversible tramways
- Self-powered reversible above-surface ropeways
- Chair lifts and gondolas with fixed or detachable grips
- J-bars
- T-bars
- Funiculars

The passenger ropeway industry is unique as far as the regulations that cover it. At one time, the industry was regulated under the Railway Act, an Act that still exists today. In the early 1950s, British Columbia initiated some of the first regulations for passenger ropeways in Canada and was involved in the initial work on the Canadian Standards Association (CSA) standards in the late 1950s and early 1960s. In 1949, Hollyburn Mountain built and operated one of the first single chair lifts in Canada. With the increase in the number of installations on other mountains, such as Grouse and Whistler, the provincial Government saw the need for proper regulation.



The regulation of passenger ropeways has progressed since the early 1950s when it only covered ski lift inspections. Passengers were carried by wire rope, which had to comply with the CSA Z-98 codes. Today the standard provides requirements for the design, manufacture, construction, modification, operation, inspection, testing, and maintenance of passenger ropeways and passenger conveyors. Over time, the CSA Z-98 codes had to change to reflect the increasing technology of the industry. Unlike the lifts of the early 1960s, which were smaller and operated at

much slower speeds, the installations built in the last twenty years move double the capacity of passengers at twice the speed of the earlier models.

British Columbia remains a leader in the industry. Although Quebec and Ontario may have more installations, theirs are shorter and smaller while this province has some of the largest. Currently, there are three reversible tramways operating in British Columbia.

With the advent of the winter games in 2010, there is a push to use innovative technology in order to meet the demands of tourism. For instance, Whistler Blackcomb has proposed installing a 3S aerial tramway, which would span about 4.5 kilometres. This tramway would be long enough to connect the two mountain tops. In the meantime, the CSA standards committee will need to address the concerns of this new technology. The regulations will need updating as well.

The Passenger Ropeway Program regulates all the passenger ropeway installations in British Columbia. Each owner and stakeholder in the industry is well aware of the program's critical role with regards to inspections, the information it communicates on safety, and the safety services it provides. Although the program is well known on provincial and national levels, it is also recognized internationally.

Services

The roles and responsibilities of the Safety Manager and Safety Officers focus on administering the *Safety Standards Act*, *Safety Standards General Regulation*, and related sections of the *Elevating Devices Safety Regulation*. These are their guides to ensure all owners and licenced contractors of passenger ropeways comply with the regulatory requirements and that their equipment is safe for public use.



Safety Manager

The BC Safety Authority appoints the provincial Safety Manager, who is given the authority to perform the following duties:

- Provide technical support and expertise to Safety Officers;
- Evaluate industry training programs and the qualifications of those who train attendants and operators;
- Provide correct interpretation of the *Safety Standards Act* and regulations;
- Issue, suspend, or revoke a contractor's licence as necessary;
- Review safety management plans;
- Issue directives, discipline orders, monetary penalties, and safety orders; and
- Review a Safety Officer's decision upon a client's request.

Other responsibilities of the Safety Manager include recommending regulatory changes, providing input on the operational functions of the program, advising on risk management systems, and undertaking incident investigations. Some of the other duties are sitting on the Canadian Standards Association technical committee for maintaining codes and technical standards and offering input into the ongoing development of the regulations.

Safety Officers

Safety Officers are at the forefront when dealing with owners and licenced contractors. They are an integral part of the program and report on wherever safety is compromised. Some of their responsibilities are as follows:

- Issue permits;
- Answer inquiries;
- Conduct safety inspections;
- Investigate, document, and follow up on incidents;
- Promote public and worker safety awareness;
- Educate and provide technical information to industry owners and contractors on changing technology, codes, and standards;
- Develop and deliver training, seminars, and briefings;
- Grant variances;
- Provide recommendations to the Safety Manager;
- Conduct compliance monitoring and audits; and
- Assess the need for changes to the regulations.



Licences

All ski area operators are required to have a valid passenger ropeway contractor's licence. Under the regulation, there are four classes of licences, each with its own restrictions and varying scopes. For example, those with a licence to operate, repair, and maintain or test all types of surface passenger ropeways would not be allowed to operate detachable chairlifts unless they demonstrate they are qualified to do so. At present, there are over 85 licenced contractors registered with the Passenger Ropeway Program, and that number will likely increase over the coming years.

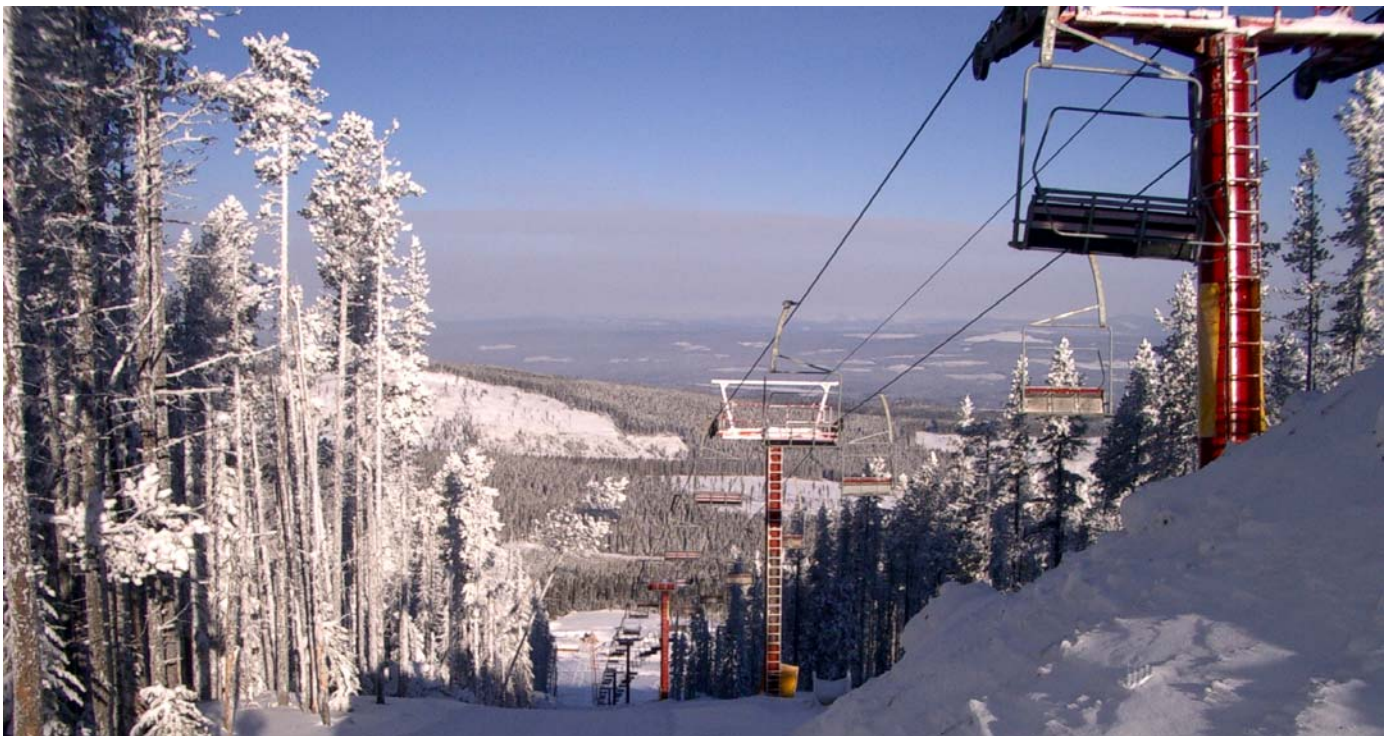
Classes of Passenger Ropeways Contractor's Licences	
Class	Scope of Licence
Class PRA	Designing, constructing, installing, altering, repairing, maintaining or testing any classification of passenger ropeway.
Class PRB	Operating, installing, altering, repairing, maintaining or testing any classification of passenger ropeway.
Class PRC	Operating, repairing, maintaining or testing of fixed-grip above-surface passenger ropeways, and all classifications of surface passenger ropeways.
Class PRD	Operating, repairing, maintaining or testing all types of surface passenger ropeways.

Contractor's licences for passenger ropeways are listed under the *Elevating Devices Safety Regulations*.

Certificates of Qualifications

The Passenger Ropeway Program does not qualify the people that operate the lifts. It does, however, qualify the people that train the lift operators and attendants. The holder of the valid trainer certificate may train others to work as attendants or operators on whatever passenger ropeways are listed on the certificate. For example, if the certificate only lists T-bars, that is the only equipment that the holder is qualified and allowed to train others to work as operators and attendants.

Certification is done in conjunction with the Selkirk College campus in Nelson, BC, through the *Train the Trainer* course, which they run once or twice a year, and with the Canada West Ski Areas Association. The Passenger Ropeway Program issues certificates of qualification based on the documented transcripts. Selkirk College offers seminars that provide instruction on the regulations, in particular, on any amendments. In addition, those who will be training the lift operators or attendants must have a certain amount of experience with lifts themselves.



Product Approvals

The Passenger Ropeway Program does not do any approvals for designs or products. In British Columbia, independent professional engineers with knowledge in the industry are to provide such approvals. Traditionally, these engineers have had prior experience working with companies that manufacture passenger ropeways.

The program does, however, maintain an extensive filing system of the technical files and drawings for each installation operating in the province. A full set of design submissions complete with technical specifications on new or modified passenger ropeways are to be submitted to the BC Safety Authority as required by the regulations. Appendix A of the CSA Z-98 code has a list of what technical submissions are required.

Design submissions also apply to new technology such as passenger conveyors (i.e. magic carpets). Passenger conveyors move passengers who stand on a flexible element. These conveyors can range up to 180 to 200 meters in length and are ideal for novice skiers and snow boarders who may have difficulty riding rope tows.



Installation Permits

Currently, there are over 225 passenger ropeways and passenger conveyors installed in more than 50 ski areas throughout British Columbia. As tourism in the province continues to improve, it is anticipated that there will be more installations in the years



to come. An installation permit is required for any new installation or relocation of a passenger ropeway. If the lift requires modification but will not be moved from where it was originally installed, then it is not necessary to take out an installation permit. Some of the factors that need consideration when applying for an installation permit are the location of the ski lift area with regards to the proximity to road crossings, avalanche areas, and other nearby structures.

Operating Permits

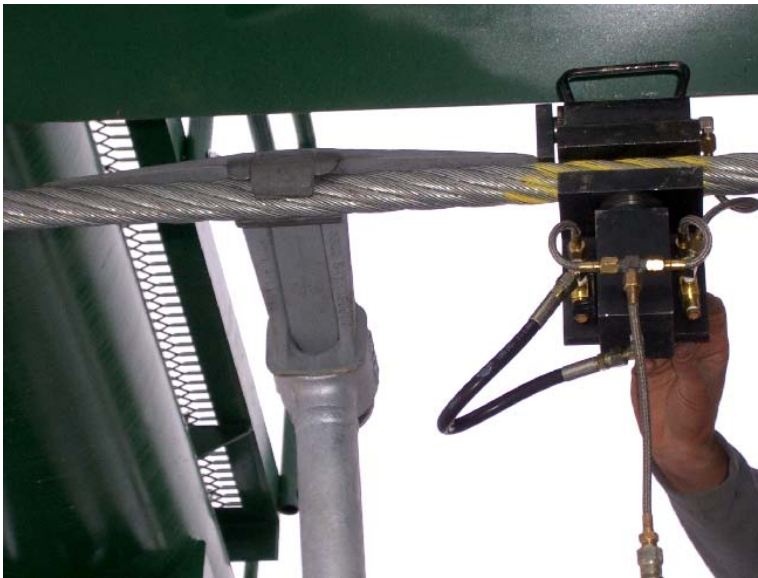
After installation, the passenger ropeway must go through an acceptance inspection by a Safety Officer before the owner can take out an operating permit and place the unit into service. The operating permit is subject to the terms and conditions of the regulations or whatever conditions the Safety Officer may attach to the permit. The BC Safety Authority issues renewals for these permits on an annual basis.

Inspections

Safety Officers may perform various types of inspections on passenger ropeways. The program provides two types of inspections as per the *Safety Standards Act* and the regulations: acceptance inspections of new installations and periodic inspections of units that are operating. Incident investigations are also a priority.

All new installations must undergo an acceptance inspection by a Safety Officer. Once the licenced contractor completes the installation, a request is made to have a Safety Officer inspect the passenger ropeway. This type of acceptance inspection can take anywhere from 24 to 72 hours.

On a typical acceptance inspection, the Safety Officer will look at towers, sheaves, deropement switches on the assemblies and foundations of the towers. Each lift will go



through a full load test with a predetermined weight made up of material such as sand or water. With a full load, the lift will be put through various operational scenarios to check that components, such as the drive systems and brakes are working as per the manufacturer's specifications.

Periodic inspections can take place at any time of the year. Although these can occur during the ski season while the lifts are in operation, inspections can also take place before the winter months.

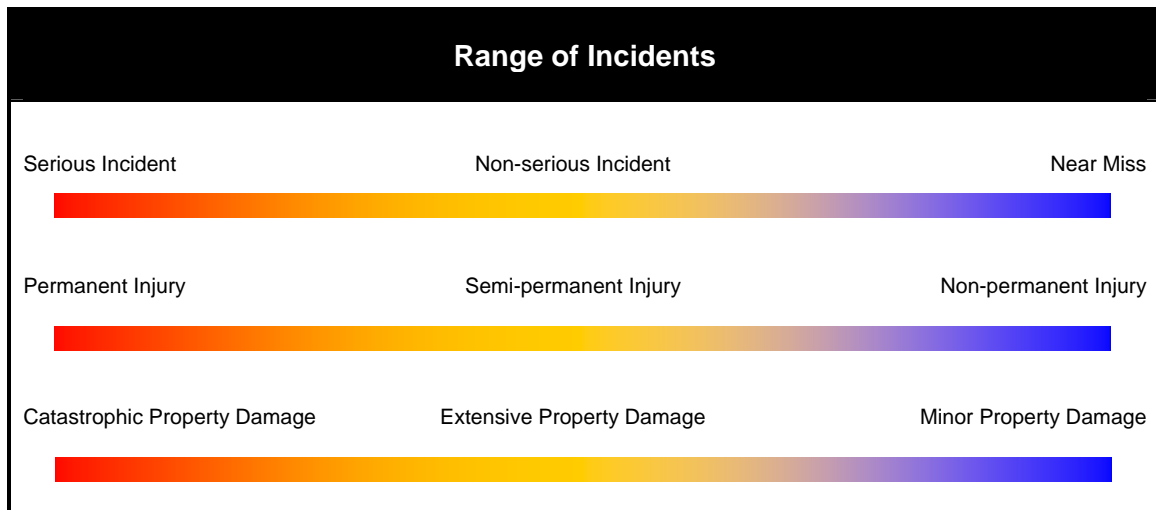
Safety Officers can conduct more inspections when the lifts are not in operation or open to the public. The time it takes for an inspection can vary, but on the operation of a chair lift, for example, it could last as long as eight hours. This would include riding the maintenance-work carrier to check towers on the line.

During a periodic inspection, a Safety Officer may inspect towers, sheave assemblies, brakes and braking functions, and the operation of main drives, auxiliary drives, and evacuation drives where applicable.

Whatever inspection occurs, the Safety Officer performs it to ensure that the installation and operation of the passenger ropeway is in accordance with the regulatory requirements.

Investigating Incidents

A Safety Officer investigates serious incidents as soon as they are brought to the attention of the BC Safety Authority. Under the *Safety Standards Act*, an incident is the occurrence of a death, personal injury, or damage to property, or the risk of personal injury or damage to property. An incident is the result of regulated work or the testing, use or operation of a passenger ropeway. The levels of an incident, personal injury, and damage to property can range from serious to minor.



Incidents involve personal injury or damage to property and range from serious to minor.



Following up on serious incidents is a priority that is critical to the Passenger Ropeway Program. The Safety Manager has issued a directive to passenger ropeway and passenger conveyor operators to clarify the reporting of incidents and the actions to be taken following an incident. For a serious incident, the Safety Officer will attend the site where practicable. Tests may be conducted on the components involved in the incident.

Incidents may be caused by mechanical failure, passenger error, abnormal weather, or operational error. Whatever the case may be, the Safety Manager will consider what measures may be taken to prevent similar incidents from occurring and what will be necessary to get the equipment back into operation.

Technical Input

As the Passenger Ropeway Program is already known nationally, recognition on an international level is growing. The program has received inquiries about regulations from other safety authorities around the world.

The program maintains an associate membership with the Canada West Ski Areas Association. This association has existed since the late 1960s and includes lift manufacturers and ski area operators as some of its members. In conjunction with the association, the program participates actively in seminars, provides training, and offers technical input in certification.



Regarding national codes, the Safety Manager has a seat on the CSA Z98 technical committee that meets annually to discuss code related issues. The location of these meetings alternates between the eastern and western parts of Canada. This committee is made up of authorities, regulators, operators, users, and manufacturers and is represented according to the Canadian Standards Association matrix mandate.

Variances

A variance is a formal document that allows for the deviation from the codes and regulations for a one-time circumstance without compromising safety. Issuing variances in the Passenger Ropeway Program is currently a rare occurrence and often minor in nature. One example dealt with the signage on a chair lift. With newer technology proposed, such as the 3S aerial tramway connecting Whistler and Blackcomb, the current standards may not have sections to cover the equipment, which may lead to variance requests.



Equivalent Standards Agreements

An Equivalent Standards Agreement is a written agreement between the client and the Safety Manager. The agreement allows for operational flexibility on performing regulated work or using a regulated product in a different manner than is prescribed by the codes and regulations. This is under the condition that the alternative approach provides for equal or better levels of safety. This type of agreement can be an innovative way for the Passenger Ropeway Program to develop a working partnership with clients in the industry to ensure safety.

Safety Management Plans

Under a safety management plan, the licenced contractor will be required, as a term and condition of licencing, to submit the names of the people and their corresponding qualifications that will service and maintain the installed passenger ropeway equipment.

Contractors will need to have this safety management plan in place at each area where passenger ropeways or passenger conveyors are operating.



Accessibility and Communications

A huge part of the passenger ropeway industry is tourism, which is an important part of the economic growth in British Columbia. It is critical for clients, stakeholders, and the public to have access to safety information and to the employees at BC Safety Authority. Several documents and forms are accessible at any BC Safety Authority office or through its website. By issuing various documents, the Passenger Ropeway Program provides information on safety issues, products that are potentially hazardous, and regulatory amendments among numerous other items.

Communicating Information		
Recipients	Documents	Methods
<ul style="list-style-type: none"> • Public • Clients • Stakeholders 	<ul style="list-style-type: none"> • Safety advisories • Directives • Information bulletins • Safety orders 	<ul style="list-style-type: none"> • Website • Contractor meetings • Post and electronic mail • Notices

The Safety Manager may issue any of four documents to relay information to clients, stakeholders, and the general public.

The Safety Manager can issue any of four types of documents. Safety advisories are non-binding and non-statutory and inform or remind the public of existing potential hazardous products or unsafe practices. The Safety Manager issues a directive to clarify the interpretation of the codes and regulations, to provide directions on the application of a regulation, or to exercise the powers granted under the *Safety Standards Act*, regulations, or code. Information bulletins are non-binding and non-statutory and are issued to provide general information to BC Safety Authority staff, stakeholders, clients, and the public. Finally, safety orders are binding and are issued to prevent, avoid, or reduce the risk of personal injury or damage to property. A safety order can be processed within a few days and is sent out to reach as many affected clients as possible.



Other Services

Public safety is of the utmost importance and incidents that occur in the passenger ropeway industry generally involve the public. A project under consideration for the Passenger Ropeway Program involves educating the public on safety when riding passenger ropeways and passenger conveyors. Working in alliance with the Canada West Ski Areas Association may help the program develop public education.

Resources

The Safety Manager of the Passenger Ropeway Program is a major resource for providing technical expertise to the Safety Officers and industry stakeholders. Several years of work experience and competent technical knowledge along with interpersonal communication skills are important assets for the Safety Manager to have.

Safety Officers of the program should have knowledge on the basic design, construction, maintenance, testing, and operation of passenger ropeways and passenger conveyors. Work experience in the industry is essential as is training from a recognized trade, such as a millwright or electrician. They should also have an understanding of avalanches: what causes them; how to control them; and how to recognize avalanche terrain. In addition, a Safety Officer needs a passing mark of 70 percent on the Safety Officer Certificate of Qualification Examination within the first six months of employment at the BC Safety Authority.



Since Safety Officers are at the forefront when dealing with owners and licenced contractors, they are likely to receive inquiries about the codes and regulations. Having full knowledge of the CSA Z-98 codes along with the *Safety Standards Act*, the *Safety Standards General Regulation*, and relevant sections of the *Elevating Devices Safety Regulations* is important for them. To further guide them, the BC Safety Authority provides additional training and continues to update and develop standard operating procedures and policies for them to follow.

With new technology continuing to surface in the industry, Safety Officers are encouraged to upgrade their knowledge and may attend seminars or take relevant courses. As well, the BC Safety Authority provides additional training and resources for Safety Officers to conduct inspections and enforce the codes and regulations.

Inspections of a passenger ropeway can take place during its construction and periodically throughout its lifecycle. Regardless of when the inspection occurs, Safety Officers may use the following tools:

- Helmet
- Hand tachometer
- Level
- Digital camera
- Dynamometer
- Stop watch
- Inclinator (to measure angles of slopes)

Ski boots and skis are other pieces of equipment the Safety Officers use during the operational inspection and testing of passenger ropeways. Approved fall arrest equipment is mandatory when Safety Officers are climbing towers and onto the passenger ropeway station.

Clients and Stakeholders

Passenger ropeways are part of a high profile industry and the Passenger Ropeway Program understands how important it is to work with clients and stakeholders.

The program works closely with a technology committee and the Canada West Ski Areas Association, and communicates with the Canadian Standards Association on a routine basis. In addition, the involvement with clients is a necessity. There are over 60 clients registered with the program and each of their input on amending the codes, standards, and regulations is essential. Clients, along with stakeholders, know what changes are necessary for the industry, and the program realizes the importance of listening to their concerns and maintaining an open dialogue with them.



Some of the areas where the program has an impact are as follows:

- Ski resorts
- Tourism industry
- Manufacturers and suppliers of passenger ropeways and passenger conveyors

These are some of the groups the program liaises with:

- Alberta Elevating Devices & Amusement Rides Safety Association (AEDARSA)
- Technical Standards & Safety Authority (TSSA)
- Colorado Passenger Tramway Safety Board
- Canadian Standards Association (CSA)
- Canada West Ski Areas Association (CWSAA) and Ontario Snow Resorts Association
- Selkirk College
- Canadian Ski Council
- BC Alpine Ski Association
- Ski and Snowboard Canada
- Canadian Avalanche Association
- National Ski Areas Association (NSAA)
- Tourism Industry Association of Canada (TIAC)



Industry clients and stakeholders rely on the program to provide consistent delivery of safety services, participate in industry conferences, and be a knowledge-based organization.

Future Growth

With the anticipation of an increase in tourism and the development of new ski areas the Passenger Ropeway Program can expect to face some challenges in the coming

years. It is conceivable that the number of visitors coming to these resorts in British Columbia will double by the year 2016. The program will need to accommodate this growth.

Although the program is well known across Canada, it will need to maintain its international reputation, as well. The advent and regulation of new technology, such as the 3S passenger ropeway proposed at Whistler and Blackcomb, should help the program to retain a leadership status. Educating the public on the safe riding of passenger ropeways and passenger conveyors is another area for consideration. In any case, public safety, preventing accidents, and reducing the number of incidents will be the priorities for the program.

The BC Safety Authority has a vision of being an internationally recognized authority by 2014 in the delivery of safety services. In order to reach that level, the program strives to offer the best and most up-to-date services and retain qualified people with expertise to deliver those services.



Revision History

Revision	Revision Date	Revision history	Revised by
00	2006/11/29	New release	Jeff Taylor
01	2006/12/20	Services–changed “provincial government” to “BC Safety Authority.” Reformatting headings and tables	Jeff Taylor

Approval

This document has been approved for adequacy by:



Greg Paddon
Provincial Safety Manager – Passenger Ropeway

December 20, 2006

Date