	Elevating and Amusement Devices Safety Division	Ref. No.: 224/07-r2
	GUIDELINE	Date: March 21, 2022

IN THE MATTER OF:

THE *TECHNICAL STANDARDS AND SAFETY ACT* 2000,
S.O. 2000, c. 16
- and -
ONTARIO REGULATION 209/01 (Elevating Devices) made under the
***Technical Standards and Safety Act,* 2000**
- and -
the Elevating Devices Code Adoption Document dated June 1, 2001, as amended by ED CAD 295/22

Subject: Periodic Engineering Review and Assessment of Above-surface Passenger Ropeways (Aging Ski Lift Assessment)
Distribution: Posted on TSSA website

1. DIRECTOR'S GUIDELINE

1.1 **General**

1.1.1 All persons operating above-surface passenger ropeways in Ontario shall comply with Section 5.8 of the Elevating Devices Code Adoption Document amendment (ED CAD 295/22), adopted in the Elevating Devices Regulation, and in accordance with the requirements stated in this Guideline.

1.2 **Frequency for Periodic Engineering Review and Assessment (Aging Ski Lift Assessment)**

1.2.1 Effective for the 2021/22 operating season and thereafter,

1.2.1.1 All above-surface passenger ropeways installed during or after 2006 (with average annual usage rates not exceeding 1500 hours/year) shall be subject to periodic engineering assessment as follows:

a) first or initial engineering assessment:
- maximum 30,000 hours of operation,
- without exceeding 20 years from the initial start-up;

("initial start-up" means first permitted for use anywhere.)

b) second engineering assessment:
- maximum 45,000 hours of operation,
- without exceeding 30 years;

c) third engineering assessment:
- every 5 years after the second engineering assessment

1.2.1.2 Device installed prior to 2006 will continue to observe the previous engineering assessment schedule

a) first or initial engineering assessment:
- maximum 22,500 hours of operation,
- without exceeding 15 years from the initial start-up;

("initial start-up" means first permitted for use anywhere.)

b) second engineering assessment:

- maximum 37,500 hours of operation,
- without exceeding 25 years;

c) third engineering assessment:

- every 5 years after the second engineering assessment

1.2.2 Despite the frequency stated in 1.2.1, reporting due dates may deviate somewhat as permitted by the Director. Table 1 provides a sample of the updated assessment periods for some hourly usage examples following the frequencies of 1.2.1.1.

Years in Operation	Hours Accumulation (example for devices with different annual usage)				
1	1000	1200	1500	2000	2500
2	2000	2400	3000	4000	5000
...					
12	12000	14400	18000	24000	30000
13	13000	15600	19500	26000	32500
14	14000	16800	21000	28000	35000
15	15000	18000	22500	30000	37500
16	16000	19200	24000	32000	40000
17	17000	20400	25500	34000	42500
18	18000	21600	27000	36000	45000
19	19000	22800	28500	38000	47500
20	20000	24000	**30000**	40000	50000
21	21000	25200	31500	42000	52500
22	22000	26400	33000	44000	55000
...					
30	30000	36000	**45000**	60000	75000
...					
35	35000	42000	52500	70000	87500
...					
40	40000	48000	60000	80000	100000
...					
45	45000	54000	67500	90000	112500

Note 1: annual usage = hours in row1
Note 2: Average annual usage is assumed to be 1500 hrs
Note 3: colour shading indicates an assessment period

1st assessment | 2nd assessment | 3rd & Sub assessment

Note 4: higher usage devices (denoted in the red rectangle) may use the intervals defined in 1.2.1, or may be dealt with individually using a risk based approach that is submitted to TSSA and approved by the Director.

Table 1
(applicable for installation in 2006 and later)

Higher usage devices may follow the frequencies listed in 1.2.1.1, or may utilize a risk approach for the assessment and management of the critical components (as impacted by fatigue, corrosion and/or wear) as permitted by the Director.

Where assessment frequencies are varied the next reporting date noted on the registered copy of the Aging Ski Lift Assessment report will apply. For a current listing of device installation numbers and their next scheduled frequency for the Aging Ski Lift Assessment report, contact TSSA or obtain a copy of the **Aging Ski Lift Assessment Schedule** from the web site.

1.3 Aging Ski Lift Assessment

1.3.1 The **Aging Ski Lift Assessment** shall identify passenger ropeway parts that are affected by:

a) **fatigue** and **vibration** of both **moving components** and **fixed structures** causing cracks and fractures of connections and parent metal; and
b) **environmental factors** like snow, ice, rain, temperature, humidity, and dust causing corrosion and deterioration of structural, mechanical and electrical components, and shall determine the extent of their deterioration, and evaluate their security at time intervals established in section 1.2 of this bulletin.

1.3.2 The following sources shall be used as guides to assess the security of the passenger ropeway parts:

a) The latest version of CSA Standard Z98
The latest version of CSA Standard Z98 shall be used as a guide to establish criteria to assess safety of parts impacted by an aging ropeway. Those parts of passenger ropeway installation requiring alteration, replacement and/or repair shall meet the requirements of the latest adopted version of CSA Standard Z98, and

b) The requirements by Manufacturer/Designer of the Passenger Ropeway
The requirements by Manufacturer/Designer of the Passenger Ropeway shall be used as a guide for those parts of the passenger ropeway installation requiring alteration, replacement and/or repair shall meet the requirements established by the manufacturer/designer of the passenger ropeway. Where manufacturer or designer is no longer in business, an engineer shall establish requirements for alteration, replacement and/or repair, and

c) Non-Destructive Testing (NDT) of Critical Components
Non-Destructive Testing of Critical Components shall be undertaken for all above-surface passenger ropeway critical components. Any components to be tested that are not directly accessible shall be disassembled. The method of non-destructive, acceptance/rejection criteria, and other tolerances shall be in accordance with the specification specified by the manufacturer/ designer. Where manufacturer or designer is no longer in business, an engineer shall perform that action.

1.4 Critical Components

Critical components are those parts of ropeway, the failure of which would immediately jeopardize passenger safety. The list of critical components of an above-surface ropeway shall include, but not be limited to the following:

MOVING COMPONENTS:
- Carrier(s)[1], including grip, hanger, chair, or gondola;
- Drive and return sheaves including shafts;
- Line sheave assemblies and their attachments;
- Tension systems and their attachments; and
- Wire rope, including haul ropes, track ropes and counterweight ropes

[1]Note: Refer to section 3.5 of this guideline for determination of NDT criteria for carriers

FIXED STRUCTURES
- Drive terminal structure;
- Return terminal structure;
- Towers and cross-arms; and
- Catwalks

Identification of every critical component of an above-surface passenger ropeway shall be based on its definition and requirements contained in the latest adopted version of CSA Standard Z98 – Passenger Ropeways. According to the CSA Standard Z98, critical component means " a component or system of components, the failure of which would immediately jeopardize passenger safety".

Note: This guideline is not the subject of, nor does it address electrical components which are covered elsewhere by the regulation, code and maintenance programs.

1.5 **Aging Ski Lift Assessment Findings**

1.5.1 A professional engineer shall certify (stamp/seal) the Aging Ski Lift Assessment report. The report shall address:
a) guidelines established in Section 1.3; and
b) the requirements to correct all non-compliance related findings to achieve compliance with the requirements of Section 5.8 of the CAD under the Elevating Devices Regulation.

1.5.2 An owner shall attest that he/she will comply with the requirements of the Aging Ski Lift Assessment report to achieve compliance with the requirements of Section 5.8 of the CAD under the Elevating Devices Regulation.

1.5.3 The Aging Ski Lift Assessment report prepared in accordance with the requirements of Section 1.4 of this Guideline shall be submitted to the Technical Standards and Safety Authority (TSSA) for its registration.

1.5.4 Prior to registering the report, TSSA shall evaluate the Aging Ski Lift Assessment report for its technical integrity and conformance to the requirements of this Guideline. The report shall be registered without conditions, registered with conditions or rejected with explanation.

1.5.5 An owner of an above-surface passenger ropeway **shall not operate the ropeway prior to the registration of the Aging Ski Lift Assessment report**.

2. BACKGROUND

2.1 **General**

The Elevating Devices Regulation made under the *Technical Standards and Safety Act (TSS Act)* adopts the Elevating Devices Code Adoption Document (CAD). This Guideline is prepared in keeping with the Section 5.8 of the CAD that reads:

"Every above-surface passenger ropeway shall be subjected periodically to a complete engineering review and assessment to ensure its continued operational safety in accordance with guidelines set by the director."

Section 5.8 of the CAD is intended to deal with the impact on the safety of above-surface passenger ropeway as a result of its age. Even though a ropeway is maintained to keep up with its original or current design/manufacturing specification during its life, over the period of time the following elements will still weaken parts of the ropeway that can fail accidentally:

- Fatigue and vibration of both moving components and fixed structures causing cracks and fractures of connections and parent metal; and
- Environmental factors like snow, ice, rain, temperature, humidity, and dust causing corrosion and deterioration of structural, mechanical and electrical components.

Above-surface passenger ropeways include those ropeways on which passengers are transported in rope-supported carriers and are not in contact with the ground or snow surface. Chair lifts, gondola lifts, and reversible ropeways are above-surface passenger ropeways.

Periodic engineering review and assessment of every above-surface passenger ropeway will ensure continued compliance with the TSS Act, Elevating Devices Regulation, and CAD, which in turn is intended to ensure continued operational safety.

This Guideline expounds upon the following criteria to meet the intent of Section 5.8 :

- frequency for periodic engineering review and assessments;
- guidelines for periodic engineering review and assessment of above-surface passenger ropeways;
- reporting engineering review and assessment findings; and
- compliance.

3. INSTRUCTIONS

3.1 Those recommendations of the Aging Ski Lift Assessment report requiring major and minor alterations of the above-surface passenger ropeway shall be dealt in accordance with the requirements of the Technical Standards and Safety Act, Elevating Devices Ontario Regulation, and Code Adoption Document. All alterations may be submitted as one design submission. The design submission for major alteration(s) must be registered and inspected prior to the operation of the ropeway.

3.2 The fee prescribed in the fee schedule for evaluation of the Aging Ski Lift Assessment report will be charged to the submitter of the report.

3.3 Submit one electronic copy to TSSA for registration. Upon registration of the Aging Ski Lift Assessment report, TSSA will return a registered electronic copy.

3.4 Where the latest adopted version of CSA Standard Z98 – Passenger Ropeways and this Guideline requires action by a designer or manufacturer who is no longer in business, that action shall be performed by a professional engineer as defined in the Elevating Devices Regulation.

3.5 This Guideline establishes in-depth inspection and compliance requirements to ensure security of critical components of an above-surface passenger ropeway. In order to expedite registration of Aging Ski Lift Assessment report in accordance with Section 1 of this Guideline, it is critical that consistent “methodology” is applied to confirm compliance with this Guideline:

a. Compile “as built” specification of the ropeway necessary to assess security of critical components of an above-surface passenger ropeway.

b. Identify critical components of an above-surface passenger ropeway subjected to fatigue, vibration, and environmental exposure for their inspection.

c. Prepare list of critical components and non-destructive testing methods to be applied for their inspection.

- All critical components shall be tabulated with identification
- Including the type of non-destructive testing conducted, rejection/acceptance criteria, findings, and recommendations
- The recommendations may contain establishing program of inspection/maintenance, steps to repair, replace, and/or alter the critical components.

d. Where critical components to be inspected are not directly accessible, any disassembling required must be performed where deemed necessary.

e. Evaluate the findings of the inspection with a view to confirm the security of critical components.

f. Determine action (repair, replacement and/or alteration) taken or to be taken to secure the integrity of critical components.

g. In addition to the assessment criteria listed in section 1.4 and Z98 (requirement 12.18.3.2 of Z98:19 NDT a minimum 20% of carriers per year), aging assessments of carriers should examine prior NDT reports in

conjunction with any replacement modification and repair records to determine if a greater number of carriers require yearly NDT.

3.6 Necessary non-destructive testing (NDT) may be spread (staggered) over a period not exceeding five years to assist planning for compliance with this Guideline in accordance with the "Frequency for Periodic Engineering Review and Assessment" established in Section 1.2.

3.7 The current Aging Ski Lift Assessment Report confirming compliance with this Guideline in keeping with the "Frequency for Periodic Engineering Review and Assessment" established in Section 1.2 shall be linked by reference to all previous Aging Ski Lift Assessment Report(s) for a specific passenger ropeway in order to justify and resolve the following conditions (where applicable):

- Next NDT cycle (other than Section 1.2 of this Director's Order) for newly replaced parts identified in the previous Aging Ski Lift Assessment Report(s);
- Compliance with all outstanding recommendations and conclusions identified in the previous Aging Ski Lift Assessment Report(s);
- Compliance with "Notice of Registration of Design Submission with Conditions" attached to previous Aging Ski Lift Assessment Report(s) registered with the TSSA.

3.8 This Guideline is not intended to replace any requirements contained in the latest adopted version of CSA Standard Z98 – Passenger Ropeways and Ontario Regulation.

3.9 This is a reminder that "Operation and Maintenance" requirements under Section 32 of the O.Reg 209/01 must be adhered to at all times. When replacing parts of a ropeway, Section 32(5) of the O.Reg 209/01 applies. All work must be performed by qualified persons.

4. GUIDELINE CHECKLIST

An electronic copy of the aging ski lift assessment should be submitted to TSSA for registration and should contain;

- Aging ski application form and document transmittal
- Information regarding general lift specifications and parameters
  - Name, # of carriers, rise, length, speed, type, etc…
- Lift history
  - Summary of alterations since commissioning and since previous assessment
  - Indication if lift was relocated
- List of critical components of an above-surface passenger ropeway subjected to fatigue, vibration and environmental factors.
  - Include the list of NDT methods applicable
  - Summary of results for each component
- In addition to the assessment criteria listed above and Z98-14 12.18.3 (NDT a minimum 20% of carriers per year),
  - aging assessments of carriers should examine prior NDT reports in conjunction with any replacement modification and repair records to determine if a greater number of carriers require yearly NDT.
- An Appendix showing actual NDT reports for the current cycle (i.e. the last 5 years in most cases)
- Engineer's evaluation of inspection and NDT reports. Evaluation shall include:
  - List of action items such as repair, replacement and/or alteration to secure the integrity of critical components
  - Comments on the state of the lift since the previous Aging Ski Lift Report.
    - Summary of the current and previous engineering reviews
    - Compliance with all outstanding recommendations and conclusions identified in the previous Report.
    - Compliance with any Notice of Registration Conditions attached to the previous registered Aging Ski Lift Report.
  - A suggested plan for the next NDT cycle

Aging Ski Lift Assessment Report FAQ's

4.1 Can I submit my Aging Ski Lift Assessment Report earlier than the scheduled year?
Yes. You do not need to submit a variance for this. However, the frequency of subsequent assessments will be based on the latest Aging Ski Lift Assessment Report submitted. For example, if your Aging Ski Lift Assessment Report is due in 2021 but you did all the work and submitted in 2020, your next Aging Ski Lift Assessment Report will be due in 2025 instead of 2026 as originally scheduled.

4.2 Can I submit my Aging Ski Lift Assessment Report later than the scheduled year and still be able to run my lift?

4.2.1 If you have completed all necessary NDT and are just waiting for the engineer to complete the Aging Ski Lift Assessment Report, you may submit any time prior to the next regular ski season without a variance application provided that:

(a) your engineer sends a letter to TSSA confirming that all necessary NDT is completed and there are no deficiencies found that will prevent the lift from running
(b) there are no open TSSA inspection orders that prevents the lift from running

4.2.2 If you have NOT completed all necessary NDT,

(a) you would need to apply for a variance to this Director's Order and request an extension.
(b) you may not run your lift for the season unless a variance is granted, or the due Aging Ski Lift Assessment Report is completed and registered.

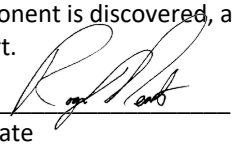
4.3 Our Aging Ski Lift Assessment Report is due, but we are not planning to run our lift this year. Do I still need to submit the Aging Ski Lift Assessment Report?
No. However, the Aging Ski Lift Assessment Report must be completed and registered prior to your next planned opening date.

4.4 Our Aging Ski Lift Assessment Report is due, but we are retiring our lift in the next year or two, do we need to submit the Aging Ski Lift Assessment Report?
In order to operate, a completed and registered Aging Ski Lift Assessment Report is still required. You may seek an exemption to submit the Aging Ski Lift Assessment Report through the variance process.

4.5 Do I have to do all the NDT required on the scheduled year?
No. Necessary NDT may be spread or staggered over a period not exceeding five years.

4.6 I just replaced <critical component example> last year and my Aging Ski Lift Assessment Report is due next year. Do I need to NDT it?
Replaced or new components may follow a different schedule from all other components. Please consult your manufacturer and/or engineer for the appropriate timeline for NDT for any replaced or new components and include it in the suggested plan for the next NDT cycle.

4.7 I cannot find the original lift specs or parameters for my lift. What do I do now?
You can request for a copy of any submitted files with TSSA through our Public Information Services Department: https://www.tssa.org/en/about-tssa/release-of-public-information.aspx
If there are no records for the original lift specs or parameters, please consult the manufacturer/designer of the lift. If the manufacturer/designer is no longer in business, please consult your engineer and your Ski-lift mechanic to gather as-built information for your lift and include these details in your Aging Ski Lift Assessment Report. Where an altered component is discovered, an alteration submission may be required in addition to your Aging Ski Lift Assessment Report.



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Director, Ontario Regulation 209/01(Elevating Devices) appointed under the *Technical Standards and Safety Act, 2000*

This Guideline has been developed in consultation with the Ski Lift Devices Advisory Council.