



ORGANIZZAZIONE INTERNAZIONALE TRASPORTI A FUNE
INTERNATIONALE ORGANISATION FÜR DAS SEILBAHNWESEN
ORGANISATION INTERNATIONALE DES TRANSPORTS A CABLES
INTERNATIONAL ORGANIZATION FOR TRANSPORTATION BY ROPE
ORGANISACION INTERNACIONAL DES TRANSPORTES POR CABLE

Technical recommendations in effect

BOOK N. 24
(November 2008)

RELATING TO RELOCATION OF EXISTING ROPEWAY INSTALLATIONS DESIGNED TO CARRY PERSONS

This Recommendation is not mandatory but provides guidance to the profession. Its application would be desirable in all countries, however, without prejudice to national standards as well as requirements specified by public authorities.



ROMA 1957
PARIS 1963
LUZERN 1969
WIEN 1975
MÜNCHEN 1981
GRENOBLE 1987
BARCELONA 1993
SAN FRANCISCO 1999
INNSBRUCK 2005

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O. I. T. A. F.

O.I.T.A.F. RECOMMENDATION

RELATING TO RELOCATION OF EXISTING ROPEWAY INSTALLATIONS DESIGNED TO CARRY PERSONS (HIGH ROPE SKI TOWS, FIXED GRIP AND DETACHABLE GRIP UNIDIRECTIONAL ROPEWAY INSTALLATIONS)

Book n. 24

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Foreword

Relocation of existing ropeway installations may prove to be in many situations an important and economically indispensable factor of the regional development of the concerned region seen that for a rule in most instances existing ropeway installations are moved from a site situated in a region having a highly developed infrastructure for the transport of tourists to another site situated in a region suffering from insufficient development of its touristy infrastructure and facing the challenge of steps that have to be taken to improve it ..

Due consideration ought to be given to the fact that the state of the art of the ropeway installation to be moved to another site is the state of the art of the moment in time in which the installation has been built and hence necessary to see prior to launching the relocation project whether the level of safety and likely future cost efficiency of the concerned installation are such as to justify a relocation. Amongst other details it is necessary to assess the effective past service time in hours of the existing installation and get information on whether it has been mainly used in winter or in summer, or predominantly in one or the other season, the number of persons carried, the effect of environmental action etc.

The results of the above assessment, as well as the result of the assessment of the programmed measures that will have to be taken to adapt the technical level of the installation to a level deemed to meet present day safety requirements are the two fundamental pieces of information permitting to evaluate the soundness of the relocation project.

Seen the development of the ropeway technique which has taken place over the last twenty years and the increased demand on safety it is quite obvious that depending on the age of the ropeway installation which is to be moved to another site relocation involves quite extensive retrofitting of the old ropeway installation.

Recommendation

The scope pursued by this recommendation is the harmonization of construction and operational criteria to be met by ropeway installations which are moved from their original site to another site situated in the same country or a site in another country.

This recommendation is intended in particular for countries which do not have their own national regulations or have but fragmentary technical specifications governing the relocation of existing ropeway installations.

This recommendation has been drafted by an ad hoc working group set up by the O.I.T.A.F. Management Committee composed of the following members :

Name	Fonction	Representing	Country
Martin Leitner	convener of the WG	IARM (Fa. Leitner AG)	I
Jean Souchal	Secretary of the WG	IARM (Fa. Pomagalski)	F
Istvan Szalai	member	IARM (Fa. Doppelmayr – Garaventa)	CH

Francois Gruffaz / Daniel Pfeiffer	member	French Ministry for Transports	F
Peter Sedivy	member	Austrian Ministry for Transports	A
Pierpaolo Siazzu	member	Italian Ministry for Transports	I
Tomasz Wilk	member	Polish Ministry for Transports	PL
Peter Huber	member	FIANET (VdS - German Association of Ropeway Operators)	D
Danilo Chatrian	member	FIANET (ANEF – Italian Association of Ropeway Operators)	I
Andreas Rødven	member	FIANET (ALF – Norwegian Association of Ropeway operators)	N
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Scope

This recommendation concerns the relocation of high rope ski-tows and fixed grip and detachable grip unidirectional ropeway installations.

Definitions

Relocation of a ropeway installation

The term stands for the sequence of successive operations of dismantling, transportation, possibly storage and then reconstruction of an existing ropeway installation with in principle most components recovered from the old installation.

Identical component

A component which is exactly alike the component to be replaced without having to be modified.

Analogous component

A component (not a sub-system) which meets the following requirements :

- Does not require any modification of the design, conditions of use and required verification of the sub-systems or of other components and does not imply new hazardous scenarios.
- Guarantees the same operational, structural characteristics and at least the same functional and operational performance as the component to be replaced
- The differences, if any, with respect to the component to be replaced, (different raw material, different manufacturing procedure, different method of testing and different service and maintenance instructions) do not negatively affect other components of the ropeway installation.
- Guarantees proven performance in use (no innovation)

Manufacturer,

A specialized company responsible for the design, engineering, production, assembly, erection on the site and after sale maintenance, which has all the necessary qualities to build up a quality management system which is certified by an independent third party to the ISO 9001 standard series and encompasses all above mentioned activities of the specialized company.

Loss of metallic cross section

Loss of metal cross section expressed as a percentage of the nominal cross section of the new rope resulting from broken wires, corrosion and wear. Loose wires are counted as broken wires.

Conditions

An existing ropeway installation may be moved to another site provided the following conditions are satisfied :

1. Safety level

The technical level of the ropeway installation which is to be moved to another site shall guarantee, after relocation and application of all measures which have to be taken to upgrade the relocated ropeway to the latest state of the art in terms of safety, i.e. a level of safety equivalent to the level of safety of a new ropeway installation.

2. Technical documentation of the ropeway installation to be moved to another site

The technical documentation of the ropeway installation which is to be moved to another site shall contain at least the following information and include the following documentation:

- General design data (rated capacity, power output of the motor, horizontal and slant distance, number of carriers, distance between carriers, rope diameter, line profile, operating speed, running hours)
- Rope and line design and calculation inclusive of loads applied to line structures
- General assembly plan of sub-systems (drives inclusive of brakes, sheave assemblies, accelerators, carriers with their hangers and grips....) as well as assembly plans of line structures and stations
- Specifications (processes, operational diagrams) of the electrical and hydraulic equipment)
- Documentation relating to the retrofitting of the ropeway installation, if any
- Documentation relating to spare parts which have not been supplied by the first manufacturer
- Existing service and maintenance manuals providing precise information on the extent of recurrent inspections and records of the extent of maintenance that has been carried out in the past
- Reports on accidents and incidents, if any
- Operating instructions

3. Assessment of the ropeway installation to be relocated

Prior to dismantling the existing ropeway an inspection ought to be carried out on its original site in order to assess its general state and conformity with the technical documentation listed in chapter 2 and the results of the inspection put on record in a report providing information on the general state of the ropeway, incidents or accidents in the past, the suggested dismantling procedure and transportation of components and possibly intermediate storage.

The inspection shall be carried out in the presence of the following persons:

- The operator of the existing ropeway installation
- The manufacturer responsible for the relocation
- The operator of the relocated ropeway, if his name is known
- Possibly the supervisory body responsible for the relocation

4. Relocation of the ropeway installation

Only one manufacturer shall be assigned the full responsibility for all operations involved by the relocation of the existing ropeway, preferably the manufacturer of the ropeway to be relocated, who is most likely the person having the longest and best experience of the existing ropeway, the use which has been made of its components and action of their former environment and is most probably the person who knows best the development which has taken place since the original erection of the ropeway and enforced new regulations. He is indeed the most knowledgeable person who is able to suggest the retrofitting he deems to be necessary to upgrade of the old ropeway and make it compliant with the desired safety level.

Dismantling, transportation and temporary storage, if any, shall be entrusted to a team having the necessary experience of ropeway installations.

Prior to dismantling all necessary provisions shall be taken to record exactly the location of all components in the existing ropeway installation and thus have the possibility to trace back the original subassemblies of all components.

All necessary provisions shall also be taken to prevent components which can be re-used from being damaged while the ropeway is being dismantled and components are being stored in a temporary store and transported.

If the dismantled ropeway is to be stored over a longer period provisions shall be taken to protect all mobile components (grips, axles and shafts, sheaves, braking systems, mechanical systems of stations) against the effect of atmospheric conditions.

Submission of all relevant documents illustrating the dismantling and new erection of the ropeway installation on a new site is required.

5. Provisions governing the reconstruction of the ropeway installation

5.1 Applicable safety regulations

If the country into which the dismantled ropeway installation is to be moved and in which it has to be rebuilt has enforced no specific safety regulation the essential

requirements specified in the Directive 2000/9/EU of the European Parliament and the European Council relating to ropeway installations designed to carry persons may be regarded as being applicable. (Cf. Enclosure).

5.2 Safety analysis

The manufacturer who is responsible for the relocation shall have a safety analysis made of all ropeway installations to be relocated. In this safety analysis due consideration shall be given to the results of the site inspection of the existing ropeway installation as laid down in the inspection report, as well as to all safety aspects of the reconstruction of an old ropeway and other external actions likely to affect the safe operation of the reconstructed ropeway such as wind, snow, icing, avalanches, falling rock, rock and earth slide, earthquake, fire, crossings with other infrastructural facilities, such as roads, power lines, surface water, not forgetting the probability of the ropeway installation becoming an obstacle to air traffic.

O.I.T.A.F. have published a recommendation for a method that might be used to identify dangerous situations and dangerous scenarios which ought to be given due consideration in a safety analysis of unidirectional ropeway installations (O.I.T.A.F. Recommendation book 22.1. and 22.2)

5.3 Safety report

The result of the safety analysis shall be summarized in a safety report listing all measures that ought to be taken to prevent the risk or diminish the gravity of arising dangerous situations to an acceptable level.

The report shall also state the following details:

- a. Components which have to be replaced by identical or analogous components
- b. recovered components which have to be modified
- c. components which have to be replaced by non identical and non analogous components
- d. components to be added
- e. range of utilization of re-used components on the new site as compared to their range of utilization on the former site
- f. components of the ropeway installation which have to be subjected to non-destructive tests or functional tests.

6. **Recovered components**

The design loads to which recovered components may be subjected shall not exceed one of the two following permissible loads

- 80 % of the maximum permissible load which has been verified by calculation or
- 100 % of the maximum live load to which the component has been subjected on the original site of the dismantled ropeway

If none of the above mentioned criteria can be met on the new site recovered components may nevertheless be used provided it is possible to submit evidence of their capacity to meet one of the above mentioned criteria by presenting documents

showing the results of verifications which have been carried out (material testing certificates, new calculations, test results, modified service life, new maintenance instructions).

6.1 Ropes

Re-use of tension ropes is not permitted.

Carrying-hauling rope may be re-used if the following criteria are met :

- The general state of the rope (corrosion, geometry of the rope) permit the re-use of the rope
- The rope has not been repaired
- The results of the non-destructive inspection of the discarded rope supply evidence that the reduction of the metallic section of the rope is within the limit value given in the following table

Maximum permissible reduction of the metallic section	Reference length versus nominal diameter
15 %	500 x d
6 %	30 x d
5 %	6 x d

6.2 Other components

Any modifications of the range of utilization, if any, shall be entered into the service and maintenance manual for each concerned component. Besides that the following conditions shall be met:

- a) The use of non identical or dissimilar components, of modified components or additional components shall not adversely affect the safety of other components.
- b) Modified components, referred to in chapter 5.3, letter b) shall to meet safety requirements which are in force in the country of destination of the relocated ropeway installation in the moment of time of the modification. ¹⁾
- c) Identical, similar and added components specified in chapter 5.3, letter c) and d) shall meet safety requirements in force in the country of destination of the relocated ropeway installation in the moment of time of their assembly. ²⁾ All components falling under chapter 5.3, letter c) and d) shall be supplied by the manufacturer who has been assigned the responsibility for the relocation.

¹⁾ In principle ropeway installations built before the date of enforcement of the EU directive 2000/9/EC have to meet safety regulations which have been enforced by EU member countries before the date of enforcement of the EU Directive.

²⁾ In EU member countries these components are subject to procedures and requirements specified in the EU Directive 2000/9/EC

7. Tests and inspections which have to be carried out prior to the commissioning of the relocated ropeway installation.

All tests and inspections shall be carried out by qualified experts (for instance the manufacturer's qualified staff) or by recognized testing laboratories.

Unless otherwise specified in enforced national regulations, testing and inspection procedures shall be specified by the manufacturer who has been assigned the whole responsibility for the relocation of the ropeway installation.

Specific documents shall be issued for the following testing and inspection activities and submitted to the competent supervisory body upon request.

7.1 Supporting structures of the station and line support structures made of steel

All load bearing welds of structural steel components shall be subjected to a non-destructive inspection prior to reconstruction of the relocated ropeway installation. Should it be deemed to be convenient the wall thickness of hollow sections shall also be assessed.

7.2 Components subjected to cyclic or repeated fatigue stress

All components subjected to cyclic or repeated fatigue stress, such as for instance axles, shafts, sheaves, main axles, hydraulic cylinders, carriers and their hangers shall be subjected to a non-destructive inspection, and should it be deemed to be necessary to a functional test prior to their use.

Grips shall be subjected to a special inspection comprising a non destructive inspection, a wear test, a test of the closing pressure of jaws and other necessary functional tests. This special inspection should preferably be carried out by the manufacturer of the grip or else by the manufacturer who has been assigned the responsibility for the relocation.

7.3 Other components

The hydraulic equipment shall be subjected at least to a leak test (leak test pressure) and a functional test.

Testing of the electrical equipment shall be entrusted to the manufacturer of the electrical equipment and if the company does no longer exist to an electrical company having specialised experience.

7.4 Ropes

Carrying-hauling ropes shall be subjected to a visual and a non-destructive inspection after they have been put in place with a view to assessing their safe serviceability in operation.

7.5 Loading and functional test of the ropeway installation

The manufacturer who has been assigned the responsibility for the relocation shall carry out the necessary loading and functional tests of the whole ropeway

installation with a view to assessing the perfect interaction of all components and perfect performance of the ropeway

8. Protection at the workplace

Safety devices of the rope installation shall be made compliant with the national regulations of the concerned country.

9. Operation

9.1 Operating license procedure

The competent licensing authority is required to lay down an appropriate procedure permitting to assess and verify the implementation of all measures listed in the report drawn up in accordance with specifications listed in chapter 5.3.

9.2 Service and maintenance instructions

The manufacturer who has been assigned the responsibility for the relocation is required to lay down service and maintenance instructions for the relocated ropeway installation in which due consideration is given to the age of the ropeway installation, its past maintenance and the necessary adjustments of the old installation and maintenance instructions which had been laid down for the old ropeway installation.

9.3 Recurrent inspection

The relocated ropeway installation shall be submitted to recurrent operational inspection in accordance with the national regulations of the country of destination of the relocated ropeway installation. Next to this recurrent inspection the relocated ropeway installation shall be submitted to both the special inspection which had been imposed for the old ropeway installation and the special inspection specified in the service and maintenance manual for the relocated ropeway installation.

The frequency of inspection of components which have not been modified shall be determined with reference to the first day of service in the relocated ropeway installation.

Recovered carrying-hauling ropes shall be submitted in the first two years after relocation to an annual inspection of their external state (for instance submitted to a visual inspection or an equivalent inspection) and to an annual inspection of the internal state of the rope (magnetic induction inspection or equivalent method of inspection) with a view to assessing the rope's behaviour in the first two years after relocation. Thereafter inspection shall be carried out at intervals specified in the national regulations of the country of destination for the specific type of ropeway installation.