

## > Diagnosis of geared motors

### On ski-lifts

#### > When and why?

- Avoid breakdowns
- Vibratory monitoring during operation
- Abnormal vibrations
- New line

#### > The results

- Early diagnosis of faults
- Anticipating summer mechanical work
- Complete diagnosis of the shaft line
- Reception – balancing signature



#### > Principle

The technique is based on a vibratory signature of the bearings of the shaft lines at the drive station and the return pulley, when the line is operating normally. Bearing, gearing, coupling and imbalance faults, etc., generate vibrations. Analysing them makes it possible to detect the corresponding symptoms and to make recommendations in terms of predictive maintenance.

#### > Early detection of faults

The first objective is to avoid breakdowns during the skiing season. In order to do so, not only is it necessary to detect proven faults: broken tooth, significant wear and tear, chipped bearing etc., but above all detect emerging faults which threaten to worsen during the course of the following season. This means extracting from the signals the more or less masked symptoms of these faults by means of advanced analyses.

#### > A tried and tested methodology and dedicated tools

Dynae has gained years of experience in performing fault diagnoses on ski-lifts. The measuring tools and the analysis software which we have developed are high-performance ones as they allow multi-channel recording of the raw vibration signals and post-processing of these signals. This method is particularly suited to low rotation speeds like pulley bearings'.

#### > Complementary analysis of motor currents

Measuring and analysing the amplitude and frequency modulations of motors' AC or DC supply currents is complementary to vibratory analysis. It reveals the faults generating torque or speed fluctuations: set of pins, coupling fault, cardan fault, regulation and operating problem or electromagnetic fault on the rotors. This measuring is carried out simply by using a clamp ammeter.

#### DYNAE

- > Vibratory analysis
- > Electrical analysis
- > Infrared thermography
- > Instrumentation and sensors
- > Software
- > Training



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 Ouest, Rhône-Alpes

## Some DYNAE references concerning ski-lifts

### > Serving Operators

COMPAGNIE DU MONT BLANC	Brévent, Flégère, Grands Montets ...
SEM MONT CENIS	Stations du Mont Cenis
GRAND MASSIF	Flaine, Morillon, Samoens
STGM	Tignes
STVI	Val d'Isère
SOCIETE DES TROIS VALLEES	
<i>And: Valloire, Val Morel, Val d'Arly, Mégevè, Chapelle d'Abondance</i>	
...	



### > Serving Manufacturers

POMAGALSKI
DOPPELMAYR
SKIRAIL
...

### > Other ski-lifts

VICAT St Egrève	Vibratory and electrical diagnosis on the cable-car
TPH DE GRENOBLE	Vibratory expert survey on the drive unit

