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Customised ropeway retrofit



Two-stage industrial MAXXDRIVE™ parallel gear units



Especially compact design in UNICASE housing

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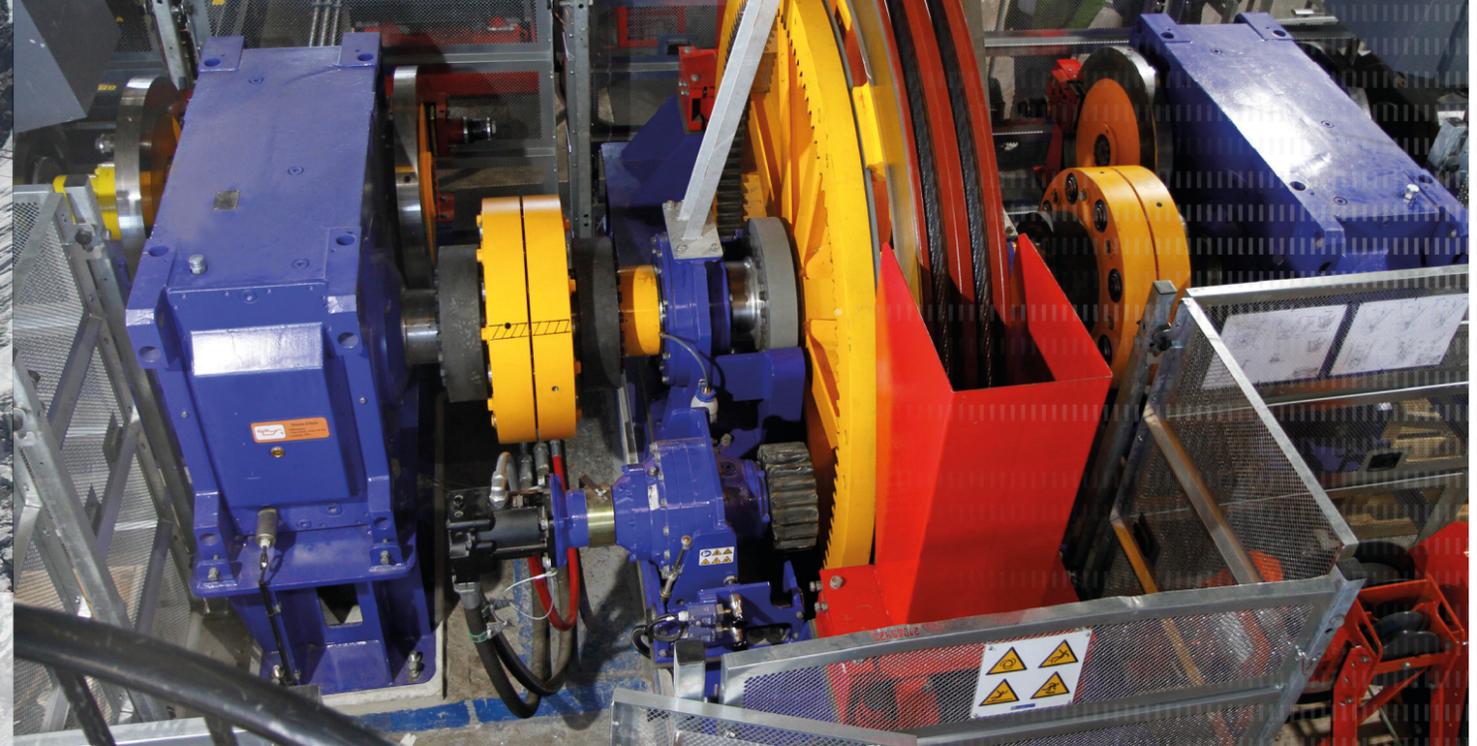
Drive Solutions for ropeway technology

Case study: Garaventa





Tignes located at 2,000 MSL is the centre of the Espace Killy skiing region in the French department Savoie. When modernising an important ropeway on Grande Motte, Swiss ropeway manufacturer Garaventa opted on the reliable and low-maintenance industrial gear units offered by NORD DRIVESYSTEMS.



Passenger transport
Ropeway



Geared motors
Industrial Gear Unit
MAXXDRIVE™

Project requirements

After two years of construction, the ropeway started operation in 1975 and since then has been transporting up to 1,010 persons an hour in one direction at a length of 1,696 m and a maximum inclination of 55 percent. In spite of meticulous maintenance, the harsh alpine weather conditions and 30,000 runs a year take their toll on this engineering masterpiece. After more than 40 years, an overhaul of this important link became necessary.

Immense forces are safely absorbed. When it comes to ropeways, the safety of human lives, which can quickly be put at risk in the event of malfunctions, is always at stake. For this reason, certain technical calculations are based on a five-fold safety margin. The bearer cable balance weight is 150 tons per track. In other words, each of the four bearer cables must bear a weight of 75 tons. Due to the exposed location and the extreme

weather conditions, a hydraulic damping system, which can absorb the forces occurring when ice drops off the ropes can also be activated for the balance weights. A 46 ton pull rope balance weight ensures the correct tension of the pull rope loop. New technology with panoramic view. Depending on weather conditions, the ropeway can reach a maximum speed of ten metres per second. In this case, the entire distance is covered in five minutes. The new technology on the Grande Motte saves the employees a lot of work. The old parallel gear units that had been in use for several decades lately required substantial maintenance and repair. For this reason, the decision for a complete retrofit of the drive trains and implementation of modern industrial gear units was inevitable. In the selection process, the NORD gear units convinced in economical and also in technical terms.

Application solution

For the ropeway project, NORD DRIVESYSTEMS delivered a drive system comprising two industrial parallel gear units ready for installation, and pre-assembled couplings with flywheels supplied by KTR Systems GmbH to Garaventa AG. One of the strengths of NORD DRIVESYSTEMS is the especially compact design of the UNICASE housing allowing maximum torques of 250,000 Nm possible up to size 15 in relation to the size. The compact design was especially important because there was limited space in the existing buildings of the Grande Motte ropeway. For this reason, connections had to be relocated individually and peripherals designed accurately to match the given dimensions of the safety enclosure.

Tried and tested power packs in a UNICASE housing. The two-stage industrial MAXXDRIVE™ parallel gear units in the second largest size 14

are characterised by a high power density, quiet operation and top reliability. Large rolling bearings ensure extremely high axial and radial load capacities and a long service life. This makes the robust parallel and right-angle gear units in one-piece UNICASE housings ideal for a great number of heavy-duty applications.

Successful commissioning and test phase. During the initial phase of operation, vibration and gear oil analyses were performed, and the results show that the industrial gear units and the entire drive train work reliably and absolutely economically. The retrofit, restoring the full function of the ropeway, so indispensable for the mountain region, meets all expectations and ensures the system is up to date again.



Optimally matched drive technology
"Industrial gear units from NORD DRIVESYSTEMS are a safe choice if absolute reliability and safe operation are required."



CUSTOMER PROFILE

The Société des Téléphériques de la Grande Motte (STGM) in Tignes operates a total of 45 ropeways from simple ski lifts to cable cars, the ropeway up to Grande Motte being one of the most important. It starts at an altitude of 3,038 metres at the top station of the underground cable car arriving from Tignes and ends at 3,454 metres in the glacier area at the Grande Motte north side.



THE PROJECT AT A GLANCE

The particularly high safety demands on products implemented in ropeway technology are a vital factor. For this reason, the ropeway is equipped with a redundant drive system in mirrored configuration. The drive shaft protruding from both sides of the large central cable pulley is connected to an identical drive system on each side. Each of the air cooled 600 kW main drives is connected to the input side of a NORD industrial gear unit via a brake disk mounted on a torsionally flexible claw coupling.