

**IN-SITU NON-DESTRUCTIVE STUDY AND ADVICE ON THE
PRESENT CONDITION OF TRACK AND HAULAGE ROPES OF BI-
CABLE JOSHIMATH-AULI ROPEWAY, HAULAGE ROPE OF CHAIR
LIFT, HAULAGE ROPES OF TWO SKI LIFT OF GARHWAL
MANDAL VIKAS NIGAM LIMITED (GMVN), JOSHIMATH**

EXECUTIVE SUMMARY

In-situ non-destructive investigational study on two track ropes (for Car no. 1 and 2), 45 mm dia. full locked coil construction each and two haulage ropes of 29 mm dia. each, stranded 6X7 construction, Right Hand Lang's lay, ungalvanised, polypropylene core of the bi-cable passenger cable car system of JOSHIMATH-AULI (GMVN) was taken up during **27-29 Jan., 2020**. Further, one haulage rope of 36 mm dia. stranded 6X17S construction, Right Hand Lang's lay, FMC of mono-cable Chair Lift system with automatic grips and another haulage rope of 16 mm dia. stranded 6X7 construction, ungalvanised, polypropylene core of mono-cable Ski Lift POMA of M/s Garhwal Mandal Vikas Nigam (GMVN), Joshimath, Uttarakhand were also studied using INTRON ROPE TESTER, Russian make as per **IS: 17235: 2019 [Magnetic Rope Testing (MRT) - Specification]** for evaluation of the present condition and assessment of their suitability for further continuance in the installation. Scanning of another haulage rope of 12 mm nominal dia. of mono-cable Ski Lift system (Old) of M/s Garhwal Mandal Vikas Nigam (GMVN), Joshimath, Uttarakhand could not be possible as the rope was not moving. Moreover, it was suggested to **replace** this Ski rope (old) during the earlier investigation in Dec., 2017. The rope has not been replaced till date as reported.

Calibration of the instrument (INTRON Rope Tester, Russian make) has been carried out in air each time before commencement of the scanning of different ropes.

In-situ investigational study on 45 mm dia. each for Car 1 & Car 2 *track ropes* installed in October, 1993, was taken up for the **9th** time during **27-29 January, 2020**. The present non-destructive analysis has revealed 50 (fifty) flaws on the *track rope for Car 1* and 37 (thirty seven) flaws on the *track rope for Car 2*. Laylengths have been found as 312 mm and 318 mm respectively [Fig. 1]. The average diameters found in two track ropes are 44.68 mm and 44.72 mm respectively. Corrosion over both the track ropes has been evidenced. These ropes are found covered with moist, dust, lubricants etc. Based on the above observations, both the track ropes are recommended for further continuance in the installation till next non-destructive investigation (in-situ study) having close visual watch of the

portions of the ropes which were not covered under this investigation and it is also suggested to have next non-destructive investigation on these ropes during **Jan.-Feb., 2021 as per IS 17234: 2019 (Operation and Maintenance of All Types of Ropeways).**

Non-destructive investigation on 29 mm dia. each of *LTP and UTP haulage ropes*, installed in Jan., 2014, was taken up for the *second* time during 27-29 Jan., 2020. The present non-destructive investigation has revealed 10 (ten) flaws in the LTP haulage rope and 9 (nine) flaws in the UTP haulage rope. Lay lengths have been found as 207 mm and 184 mm respectively for LTP and UTP haulage ropes (Fig. 2). The average diameters found are 27.78 mm and 27.83 mm respectively. Based on present observation, it is recommended for further continuance of the *LTP and UTP haulage ropes* in the installation till next non-destructive investigation and it is also suggested to have next non-destructive investigation over these haulage ropes during **Jan.-Feb., 2021 as per IS 17234: 2019 (Operation and Maintenance of All Types of Ropeways).**

Nondestructive investigation on 36 mm dia. *haulage rope* of Auli Chair Lift, installed during April, 2011, was taken up for the *second* time (after installation of present rope) during 27-29 Jan., 2020. The present non-destructive investigation has revealed approx. 16 (sixteen) flaws. Lay length has been found as 254 mm (Fig. 3). The average diameter found is 34.5 mm. Based on present observation, it is recommended for further continuance of the Chair Lift rope in the installation till next non-destructive investigation and it is also suggested to have next non-destructive investigation over this haulage rope during **Jan.-Feb., 2021 as per IS 17234: 2019 (Operation and Maintenance of All Types of Ropeways).**

Nondestructive investigation on 12 mm dia. *haulage rope* of Auli Ski Lift (Old), installed during Dec., 2003, was taken up for the *fourth* time during **24-26 Dec., 2017**. It was suggested to **replace** the rope as early as possible during Dec., 2017. But till date, it has not been replaced. Non-destructive investigation was not carried out on this old and static rope.

Nondestructive investigation on 16 mm dia. *haulage rope* of Auli Ski Lift POMA, installed during Oct., 2010, was taken up for the *second* time during 27-29 Jan., 2020. The present investigation has revealed 11 (eleven) flaws. Lay length and average diameter of this rope have been found as 113 mm (Fig. 3) and 15.77 mm respectively. Based on present observation, it is recommended for further continuance of the Ski Lift POMA rope in the installation till next non-destructive investigation and it is also suggested to have next non-destructive investigation over this haulage rope during **Jan.-Feb., 2021 as per IS 17234: 2019 (Operation and Maintenance of All Types of Ropeways).**

Rope maintenance shall include but not be limited to the following:

- (a) Lubrication: The type of lubrication and the frequency of lubrication shall be as recommended by the rope manufacturer or designer.
- (b) Ropes shall be kept clean.
- (c) Rope connections shall be protected against corrosion.
- (d) Saddles shall be liberally lubricated.
- (e) Diameters and laylengths of the ropes are required to be monitored at regular intervals.

If any discrepancy is noticed, the rope should be replaced immediately.

This non-destructive investigation on track and haulage ropes does not include the aspect of **fatigue**, which may develop in the ropes in course of time.