DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING INSTITUTE OF TECHNOLOGY UNIVERSITY OF KASHMIR NAAC Accredited Grade 'A++'

DEPARTMENTAL REPORT

Technical Tour to Mini Hydel Power Project (MHEP), Pahalgam

Department of Electronics and Communication Engineering

Date of Tour	**Wednesday, 18 November 2026**
Destination	**Mini Hydel Power Project (MHEP), Pahalgam, Jammu and Kashmir**
Participants	**Students of the Department of Electronics and Communication Engineering**
Reporting Point	**Front lawns of Block C, Institute of Technology, Zakura Campus - 7:50 a.m.**
Departure	**8:00 a.m. from the campus**
Accompanying Faculty / Staff	**Er. Rouf Ul Alam; Dr. Abdul Mueed Hafiz; Dr. Ifat Rasheed; Dr. Saima Bashir; Shahid Mohammad Shah; Qamar Ul Haq; Mir Yawar Hayat; Mudasir Ahmad; Mohd. Hussain; Shahid Raheem**
Nature of Visit	**One-day industrial / educational visit**

1. Introduction

Industrial visits provide students with an opportunity to connect classroom learning with the operation of real engineering systems. With this objective, the Department of Electronics and Communication Engineering, Institute of Technology, University of Kashmir, organised a one-day technical tour to the Mini Hydel Power Project (MHEP), Pahalgam, on Wednesday, 18 November 2026.

The visit familiarised students with the basic arrangement and functioning of a hydropower station. Through observations of the water-control structure, power-house installation and generating machinery, students gained practical insight into how the energy of flowing water is converted into electrical energy.

2. Objectives of the Tour

- To provide practical exposure to the basic working of a mini hydel power station.
- To understand the stages involved in harnessing water energy and converting it into electrical energy.
- To observe major hydro-mechanical and electrical components used in a power house.
- To relate classroom concepts of electrical machines, energy conversion, instrumentation, control and power systems to an operating installation.
- To familiarise students with industrial working practices, discipline and safety requirements.

3. Permission and Pre-Tour Arrangements

The Department made arrangements for the visit in coordination with the Jammu and Kashmir State Power Development Corporation (JKPDC). A communication from the Office of the Executive Engineer, Gas Turbine Division, Pampore, dated 2 November 2026, conveyed permission for students of B.Tech 3rd and 5th semesters to visit MHEP Pahalgam on 11 November 2026, subject to prescribed conditions. The departmental notice dated 17 November 2026, however, scheduled the actual visit for 18 November 2026. The written confirmation or revised permission covering the actual visit date should therefore be placed on record as an annexure, if issued. The conditions stated in the permission communication included carrying valid institutional identity cards, observing all safety instructions, not interfering with plant machinery or maintenance work, and complying with the conditions communicated by the Corporation.

A departmental notice dated 17 November 2026 informed students about the visit scheduled for 18 November 2026. Students were instructed to report at 7:50 a.m. at the front lawns of Block C, Zakura Campus, for departure at 8:00 a.m. They were also directed to remain with their assigned groups, carry valid identity cards and follow the instructions of the accompanying faculty and power-house staff.

4. Participants and Accompanying Faculty

Students of the Department of Electronics and Communication Engineering participated in the technical tour. The following faculty members and staff were listed in the departmental notice as accompanying the students:

Er. Rouf Ul Alam

Dr. Abdul Mueed Hafiz

Dr. Ifat Rasheed

Dr. Saima Bashir

Shahid Mohammad Shah

Qamar Ul Haq

Mir Yawar Hayat

Mudasir Ahmad

Mohd. Hussain

Shahid Raheem

The total number of students who attended the visit may be inserted after verification of the attendance record.

5. Proceedings of the Visit

The students assembled at the designated reporting point at the Institute of Technology, Zakura Campus, at 7:50 a.m. on 18 November 2026. After attendance and necessary instructions, the group departed for MHEP, Pahalgam, at 8:00 a.m. under the supervision of the accompanying faculty and staff.

At the project site, students were introduced to the layout of the hydel installation and the role of its major sections. They observed the water-control arrangement and the power-house structure. Inside the plant area, students were shown major rotating machinery and associated mechanical assemblies. The explanations helped them understand the sequence through which the energy of flowing water is transferred to a turbine shaft and subsequently converted into electrical energy by a generator.

Students also examined the project information and schematic display board, which illustrated the arrangement of the scheme, including water conveyance and the penstock leading towards the power house. They interacted with the available technical personnel and clarified their questions regarding the operation and components of the plant.

6. About the Mini Hydel Power Project, Pahalgam

MHEP Pahalgam is a hydropower installation operated under the Jammu and Kashmir State Power Development Corporation Limited (JKSPDC/JKPDC). The project harnesses the energy of flowing water to drive hydraulic turbines coupled to electrical generators. The project signage and schematic board displayed at the site provided information about the scheme and its principal components.

The photographs supplied for preparation of this report show the power-house building, a water-control structure, a large turbine/rotating assembly and a project schematic board. The installed-capacity markings visible in the supplied photographs are not consistent: the building sign appears to indicate 2 x 1.5 MW, whereas the schematic board appears to indicate 3 x 1.5 MW. Accordingly, the installed capacity and number of generating units have not been stated as confirmed figures in this report and should be verified with the project authorities before final submission.

7. Major Sections and Working Principle of a Hydroelectric Power Station

7.1 Water Intake and Conveyance

In a hydropower station, water from a river or channel is directed through an intake and water-conveyance arrangement. The intake and associated control structures regulate the entry of water into the system. The water is then conveyed towards the power house, where the available hydraulic head is used to operate the turbine.

7.2 Penstock

The penstock is a large pipe or conduit that carries water under pressure towards the turbine. The schematic board at the site identified the penstock arrangement as one of the principal parts of the project. Students were able to relate the function of the penstock to the conversion of the potential and kinetic energy of water into mechanical rotation at the turbine.

7.3 Hydraulic Turbine

The turbine is the prime mover of a hydroelectric generating unit. Water directed onto the turbine runner produces rotational motion. The rotating shaft carries mechanical power to the generator. The large rotating assembly observed during the visit helped students appreciate the size, construction and mechanical nature of equipment used in power generation.

7.4 Generator and Electricity Generation

The generator is coupled to the turbine shaft. When the turbine rotates the generator rotor, electromagnetic induction produces electrical power in the stator windings. In this way, the mechanical energy supplied by the

turbine is converted into electrical energy. The visit helped students connect the practical operation of a generating unit with the principles of electromagnetic induction and electrical machines studied in their courses.

7.5 Power Conditioning and Evacuation

After generation, electrical power is routed through the associated electrical equipment for control, protection and onward delivery to the distribution or transmission network. Depending on the station arrangement, this involves switchgear, protection devices, metering and transformers. These systems ensure that generated power can be monitored, protected and supplied safely. Specific ratings and equipment details should be added only after confirmation from the plant staff or official project records.

8. Relevance to Electronics and Communication Engineering

Although a hydropower station is primarily an energy-generation facility, its safe and reliable operation depends on electrical, electronic, instrumentation and communication systems. The visit helped students appreciate the relevance of the following areas:

- Sensors and instrumentation used for monitoring operating parameters such as temperature, pressure, water level, voltage and current.
- Electrical machines and energy conversion involved in turbine-driven generation of electrical power.
- Control and monitoring systems used to supervise the operation of generating equipment.
- Protection and switching equipment used to detect abnormal conditions and isolate faulty sections.
- Communication and signalling arrangements that support coordination, monitoring and safe operation of an industrial power facility.

9. Learning Outcomes and Observations

- Students developed a practical understanding of the basic stages involved in hydroelectric power generation.
- They observed the physical arrangement of water-control structures, water conveyance and power-house machinery.
- They gained an appreciation of the role of the turbine as the mechanical prime mover and the generator as the electrical energy-conversion device.
- They were able to relate theoretical concepts of electrical machines, electromagnetic induction and power systems to an actual installation.
- The visit highlighted the importance of maintenance, operational discipline and safety in a power-generation facility.
- The interaction and on-site explanations helped students understand the engineering roles involved in the operation of a hydropower project.

10. Conclusion

The technical tour to the Mini Hydel Power Project, Pahalgam, on 18 November 2026 was a valuable educational activity for the students of the Department of Electronics and Communication Engineering. It provided first-hand exposure to the basic arrangement of a hydropower station and helped students understand how the energy of flowing water is converted into electrical energy. The visit strengthened the connection between classroom concepts and practical engineering applications. The Department recommends that such technical visits continue to be organised to enrich students' practical learning and industrial awareness.

11. Acknowledgements

The Department of Electronics and Communication Engineering expresses its sincere gratitude to the Jammu and Kashmir State Power Development Corporation Limited and the officers, engineers and staff associated with MHEP Pahalgam for facilitating the technical visit and providing guidance to the students. The Department also

acknowledges the support of the Institute administration and the accompanying faculty and staff for ensuring the orderly conduct of the tour.

Er. Rouf Ul Alam
Coordinator
Department of Electronics and Communication Engineering
Institute of Technology, University of Kashmir

Annexure A: Photographic Record

Selected photographs supplied for the preparation of this report are placed below. Photographs of equipment inside the power house have not been included in this draft because the permission communication specifies that photography inside the power house is prohibited. Their inclusion in an official report should be subject to written approval from the project authorities.

Fig. 1: Water-control structure and associated steel framework at the project site.

Fig. 2: Exterior view of the MHEP Pahalgam power-house building.

Fig. 3: Project schematic display board at the site.

Annexure A: Photographic Record

Selected exterior photographs supplied for this report are included below. Interior power-house photographs have been excluded pending authorization, as the permission communication specifies that photography inside the power house is prohibited.



Fig. 1: Water-control structure and associated steel framework at the project site.



Fig. 2: Exterior view of the MHEP Pahalgam power-house building.



Fig. 3: Project schematic display board at the site.