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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

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PLACEMENTS

- IVth B.Tech students of Department of Electrical and Electronics Engineering (EEE), UCEK, JNTUK, successfully placed in Tata Consultancy Services (TCS) during the campus recruitment drive conducted on 25th August 2026, with a package of 3.4 LPA.



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EVENTS

- JNTUK signed a landmark MoU with Greenko Ltd and GSS@IIT Hyderabad at the University Conference Hall on 11th August 2026, to launch an M.Tech program in Sustainable Engineering (Energy Technologies). Graced by Hon'ble Vice-Chancellor Prof. C.S.R.K. Prasad, Former VC Prof. G.V.R. Prasada Raju, Greenko CSO Dr. Rambabu, and Prof. Subramanyam from IIT Hyderabad, the ceremony took place in the presence of university officials, directorate members, and faculty to bridge academia with the green energy sector starting this academic year.
- The Department of Electrical and Electronics Engineering (EEE), JNTUK, signed an MoU with Coromandel International Ltd., Kakinada, on 26th August 2026, strengthening industry-academia collaboration. The MoU provides students with opportunities for internships, industrial training, skill development, and hands-on learning opportunities. It also promotes joint research, technical knowledge sharing, expert lectures, and collaborative projects to enhance students' industry readiness and employability. The collaboration enables students to gain practical exposure and develop industry-relevant skills. This initiative further strengthens the interaction between the EEE Department and industry.



ACHIVEMENTS

- The Government of Andhra Pradesh has appointed Dr. M. Ramalinga Raju, Senior Professor, EEE, UCEK, JNTUK and Former Vice-Chancellor of JNTUK, as a Member (Higher Education Administration) of the Andhra Pradesh Higher Education Fee Regulatory and Monitoring Committee (APHEFRMC). This prestigious state-level appointment stands as a testament to his distinguished academic stature, vast administrative leadership, and decades of dedicated service to higher education. The Department of Electrical and Electronics Engineering, faculty members, staff, and students extend their heartiest congratulations to Prof. M. Ramalinga Raju sir on this well-deserved honour and wish him great success in this esteemed role.
- IInd B.Tech student of JNTUK have achieved an outstanding achievement showcasing exceptional discipline and marksmanship, Cadet K. T. S. Saathvika (Roll No: 25021A0241) of the Department of Electrical and Electronics Engineering (EEE), UCEK, JNTUK, secured First Place in the Firing Event at the Inter Group Competition Camp (IGC - VSC) conducted by the NCC Directorate AP & T. Demonstrating precision and supreme skill among competing cadets, she was awarded the Winner Trophy in Firing and contributed collectively to the triumph of the 9(A) Air Sqn Tech Unit NCC. This stellar performance brings immense pride to the institution and reflects the dedication, focus, and multifaceted excellence of the department's students across co-curricular arenas.



MANUFACTURING AND TESTING OF POLYMER INSULATOR

Abstract

Polymer insulators play a vital role in modern electrical power transmission and distribution systems due to their lightweight construction, high mechanical strength, excellent electrical insulation properties, and resistance to environmental conditions. This article presents the manufacturing process and testing procedures of polymer insulators studied during the internship at Spark Insulators Pvt. Ltd., Cherlapalli. The study covers the major manufacturing stages, including fibre-reinforced polymer (FRP) rod pultrusion, hydraulic crimping of metal end fittings, primer application, silicone rubber moulding, and curing. It also explains the quality control procedures used to ensure the reliability and performance of the finished insulators. Various inspection and testing methods, such as dimensional inspection, hardness testing, dye penetration testing, mechanical tensile testing, steep-front impulse testing, dry and wet power-frequency tests, and salt-fog pollution testing, are discussed. The internship provided practical exposure to industrial manufacturing practices, quality assurance, high-voltage testing, and workplace safety. Overall, this study helped develop an understanding of how polymer insulators are manufactured and evaluated to meet the required electrical, mechanical, and environmental performance standards.

Keywords

Polymer insulators, FRP rod, pultrusion process, silicone rubber, hydraulic crimping, high-voltage testing, mechanical tensile testing, quality control, power transmission, electrical insulation, salt-fog testing, IEC standards.

1. Familiarization with the Industrial Environment

During the internship, we gained an understanding of the industrial environment and the overall manufacturing workflow of polymer insulators. We learned how the production, quality-control, and electrical and mechanical testing departments work together to manufacture reliable insulators. We also observed the movement of materials from stores to production and the inspection stages followed before finished products are packed and dispatched.

2. Study of Raw Materials and Components

FRP rod: Provides mechanical strength and forms the structural core.

Silicon Rubber: Provides external insulation and resistance to moisture and environmental contamination.

Metal end fittings: Connect the insulator to transmission towers and conductors.

Primer and bonding materials: Help establish reliable bonding between the components.



MANUFACTURING AND TESTING OF POLYMER INSULATOR

3. Observation of FRP Rod Manufacturing

We studied the pultrusion process used to manufacture fibre-reinforced plastic rods. The process involves aligning glass fibres, impregnating them with epoxy resin, pulling the impregnated fibres through a heated die, curing the resin, and cutting the finished rod to the required length.

Particular attention was given to fibre die rod dimensions, and surface finishing. We learned that incomplete resin impregnation the mechanical and electrical reliability of the core.

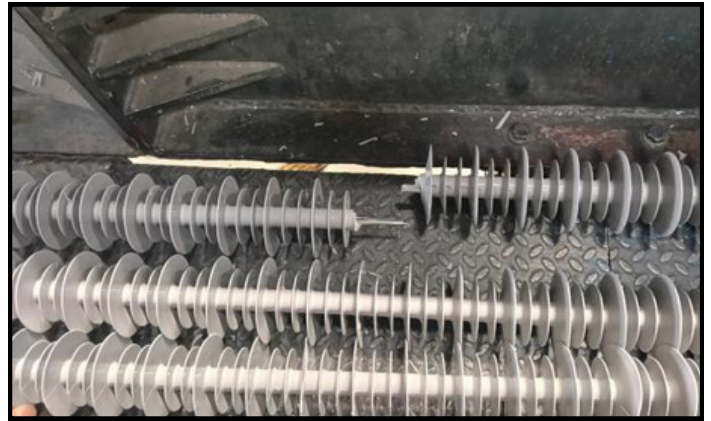
4. Study of Hydraulic Crimping

We observed the procedure used to attach metal end fittings to the FRP rod through controlled hydraulic crimping. This operation is essential because the end fittings must transfer mechanical loads safely to the core.

The activities studied included preparation and cleaning of the rod ends, checking fitting compatibility, positioning the rod, monitoring hydraulic pressure and applied force, and maintaining process records. The report also describes acoustic emission monitoring verification and tensile of the first completed assembly using a Universal Testing Machine (UTM).

5. Visual and Dimensional Inspection

We studied the inspection of completed insulators for surface defects, cracks, contamination, moulding irregularities, fitting alignment, dimensions, and marking details. Products that do not meet the specified requirements are identified for rework or rejection according to the nature of the defect.



This activity showed us that visual inspection is an important step before mechanical and electrical testing.

6. Mechanical Testing Using a Universal Testing Machine

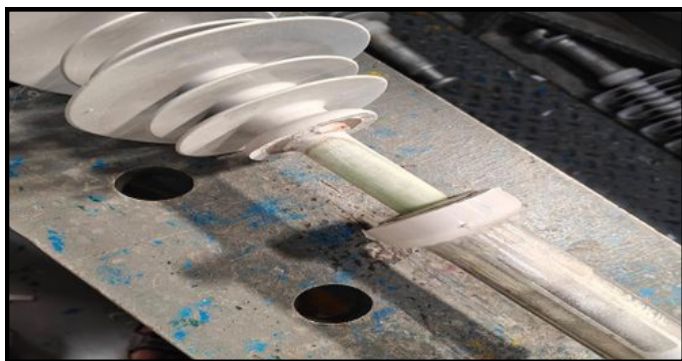
We studied the use of a Universal Testing Machine (UTM) to assess the mechanical strength of polymer insulators. The activities covered in the report included:

- Routine mechanical testing.
- Break testing.
- Acceptance testing based on specified mechanical load.
- Long-duration mechanical testing.
- Observation of cracks, deformation, and end-fitting movement.

The report describes a long-duration test in which the insulator is subjected to a sustained tensile load for 96 hours. This test helps assess the ability of the assembly to withstand prolonged mechanical stress.



MANUFACTURING AND TESTING OF POLYMER INSULATOR



7. High-Voltage Testing

An important part of the internship was studying the electrical tests used to assess insulator performance

Test performed :

1. Steep-front impulse voltage test: Evaluates performance under rapidly rising impulse voltages.
2. Dry power frequency voltage test: Checks insulation performance under dry conditions.
3. Wet power frequency test: Evaluates insulation under simulated rainfall.
4. Artificial pollution test: Assesses resistance to the best electrical flashover under salt-fog contamination.

We learned the general test arrangements, the importance of recording observations, and the need to check for flashover, puncture, leakage current, and visible damage. These tests simulate different electrical and environmental stresses that insulators may experience in service.



Conclusion:

The internship on “Manufacturing and Testing of Polymer Insulators” at Spark Insulators Pvt. Ltd., Cherlapalli, provided a comprehensive understanding of the industrial procedures involved in producing reliable polymer insulators for high-voltage electrical applications. It helped in understanding how theoretical concepts related to electrical insulation, material properties, mechanical strength, and high-voltage engineering are applied in an actual manufacturing environment.

Overall, this internship was a valuable learning experience that strengthened the understanding of polymer insulator manufacturing, testing techniques, quality assurance, and industrial safety practices. It helped connect academic knowledge in Electrical and Electronics Engineering with practical industrial applications, particularly in the field of high-voltage engineering. The knowledge gained through this study provides a useful foundation for understanding the design, production, testing, and application of polymer insulators in modern power transmission and distribution networks.

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Drone Technology - The Future in the Sky

Introduction

Drone technology, also known as Unmanned Aerial Vehicle (UAV) technology, is one of the fastest-growing technologies in the world today. A drone is an aircraft that flies without a pilot on board. It is controlled remotely or flies automatically using software, sensors, and GPS.

History

The idea of drones started during World War I, but the first modern drones were developed for military surveillance in the 1980s. After 2010, with cheaper sensors, batteries, and GPS, drones became available for civilians and industries.

Types of Drones:

1. Multi-Rotor Drones: Most common. Has 4, 6, or 8 propellers. Example: Quadcopter. Used for photography, surveillance. Cannot fly for long.
2. Fixed-Wing Drones: Looks like a small aeroplane. Can fly for long hours and cover long distances.
3. Single-Rotor Drone: Like a small helicopter. Can carry heavy payloads.
4. Hybrid VTOL: Combination of multi-rotor and fixed-wing. Can take off vertically and fly like a plane.



Fig 2.1: Types of Drones

Main Components and Working Principle:

- Frame, Motors & Propellers: For lift and movement.
- Flight Controller: The brain of the drone.
- ESC (Electronic Speed Controller): Controls motor speed.
- Battery (Li-Po): Power source.
- Sensors: GPS, gyroscope, accelerometer for stability.
- Camera & Payload: For the specific task.

The flight controller balances the speed of all motors to move up, down, forward, or rotate.

Applications:

1. Military and Defence: Surveillance, border security, bomb disposal.



Fig 2.2: Quadcopter drone and its components

2. Agriculture: Spraying pesticides, crop health monitoring, mapping fields. Very useful in India under the Kisan Drone scheme.
3. Photography and Filmmaking: Aerial shots that were earlier impossible.
4. Construction and Mapping: Surveying land, 3D mapping.
5. Environmental Monitoring: Tracking air pollution (PM2.5), forest fires, wildlife counting.

Advantages:

- Can reach places where humans cannot.
- Low cost and low risk compared to manned aircraft.
- High accuracy with AI and cameras.
- Saves time and manpower.

Disadvantages / Challenges:

- Privacy issues can be misused for spying.
- Battery life is still limited (20-40 mins for most drones).
- Security threat if used by terrorists.
- Needs skilled operators and strict rules (DGCA rules in India).
- Weather dependent, cannot fly in heavy wind or rain.

Future of Drone Technology:

The future is AI-powered autonomous drones. With 5G, swarms of drones will work together. We will see drone taxis for humans (like in Dubai), AI drones for traffic control, and nano-drones the size of insects for medical and military use. In India, the market is expected to cross \$13 billion by 2030.

Conclusion:

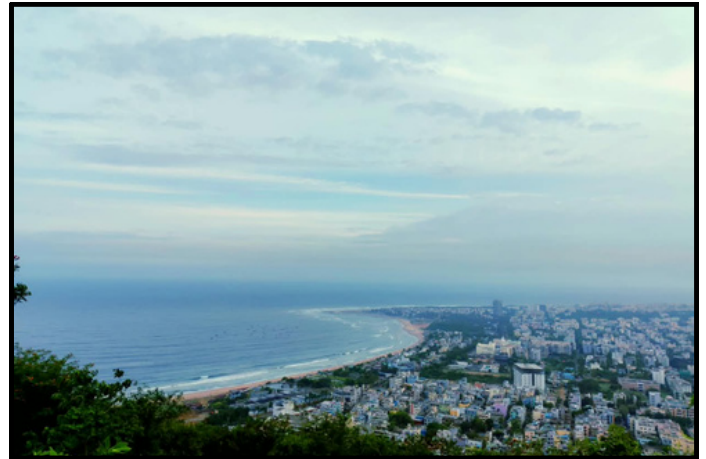
Drone technology has changed the way we see the sky. It is no longer just a flying toy, but a powerful tool that is solving real-world problems. If used with proper regulations and ethics, drones can bring a revolution in industry, agriculture, and safety. The sky is no longer the limit; it is the new workplace.

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