MAR BASELIOS CHRISTIAN COLLEGE OF ENGINEERING AND TECHNOLOGY, PEERMADE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

REPORT ON

WEBINAR

FAULT ANALYSIS ON EV VEHICLES
ABOUT THE SESSION

Organized By: Electrical and Electronics Department

Date: 13-December-2024

Venue: Google Meet

Attendees: Students of Electrical and Electronics Engineering and Mechanical Engineering

INTRODUCTION

The **Department of Electrical and Electronics Engineering** organized an insightful webinar on the topic "**Fault Analysis in EV Vehicles**" was conducted **by Mr. Sooryakiran K P**, a distinguished mechanical engineer with extensive experience in the automotive sector. His professional journey includes roles such as Analyst, Operations Manager, Warranty Administrator, and Service Engineer. With his strong technical background and effective communication skills, Mr. Sooryakiran has

consistently served as a transparent and reliable interface between manufacturers and field teams, contributing significantly to both brand image and business performance.

With the global shift toward sustainable transportation, electric vehicles (EVs) have become a central focus of innovation and policy. Governments and manufacturers are heavily investing in EV technology to reduce carbon emissions and reliance on fossil fuels. However, as EV adoption rises, ensuring their reliability, safety, and performance becomes critical.

Faults in EVs can not only cause inconvenience to users but also erode trust in new technologies if not properly managed. Unlike traditional vehicles, EVs involve complex interactions between electrical, electronic, and software systems, making fault analysis more intricate and vital.

Given this landscape, understanding and implementing robust fault analysis frameworks is essential for manufacturers, service engineers, and even academic researchers. This webinar's topic is therefore highly timely and relevant, addressing a growing need in the evolving automotive ecosystem.

OBJECTIVE OF THE WEBINAR

The session aimed to:

- Introduce participants to common faults in EV systems.
- Discuss techniques and tools for fault detection and analysis.
- Share practical case studies and field experiences.
- Emphasize the economic and operational benefits of proactive fault management.

• KEY HIGHLIGHTS

1. Overview of Electric Vehicle Architecture

Mr. Sooryakiran provided a foundational overview of major EV componentsbattery packs, electric motors, inverters, and vehicle control units setting the stage for deeper analysis.

2. Common Faults in EVs

He detailed prevalent issues including:

- Battery degradation and thermal runaways
- Controller and inverter failures
- Faulty software calibration in control units
- Communication breakdowns within CAN networks
- Charging system inconsistencies

3. Diagnostic Tools and Techniques

The session emphasized:

- Use of OBD tools and CAN bus analyzers
- Predictive fault detection through sensor data
- Thermal imaging for battery diagnostics
- AI and IoT integration in vehicle monitoring systems

4. Case Studies from the Field

Mr. Sooryakiran shared real-world examples where analytical approaches helped in early fault detection, warranty management, and customer satisfaction.

5. Interactive Q&A Session

Attendees raised questions related to diagnostic accuracy, repair protocols, data interpretation, and challenges in EV servicing, which were addressed with clarity and depth.

PO JUSTIFICATIONS

PO1 – Engineering Knowledge

The webinar deepens understanding of EV systems, control electronics, and fault mechanisms, applying electrical engineering principles.

PO2 – Problem Analysis

Analyzing faults in EVs involves identifying root causes and interpreting technical symptoms—key aspects of problem analysis.

PO3 – Design/Development of Solutions

Understanding fault modes helps in redesigning or modifying components for better reliability and safety.

PO4 – Conduct Investigations

The webinar covers data interpretation, diagnostics, and root-cause analysis—essential for structured investigation of faults.

PO5 – Modern Tool Usage

Reliable EV systems are essential for public safety and mobility, emphasizing the engineer's responsibility to society.

PO6 – The Engineer and Society

EVs contribute to reducing emissions; learning to maintain and improve their reliability supports sustainability goals.

PO8 – Ethics

Ethical fault reporting, transparency in service, and ensuring safety align with responsible engineering ethics.

PO9 – Individual and Team Work

Fault analysis often requires cross-functional collaboration between design, diagnostics, and service teams.

PO10 – Communication

Effective communication of inspection findings, reports, and technical documentation.

PO12 – Life-Long Learning

Encourages continual learning about evolving quality standards, tools, and industry best practices.

PSO JUSTIFICATIONS

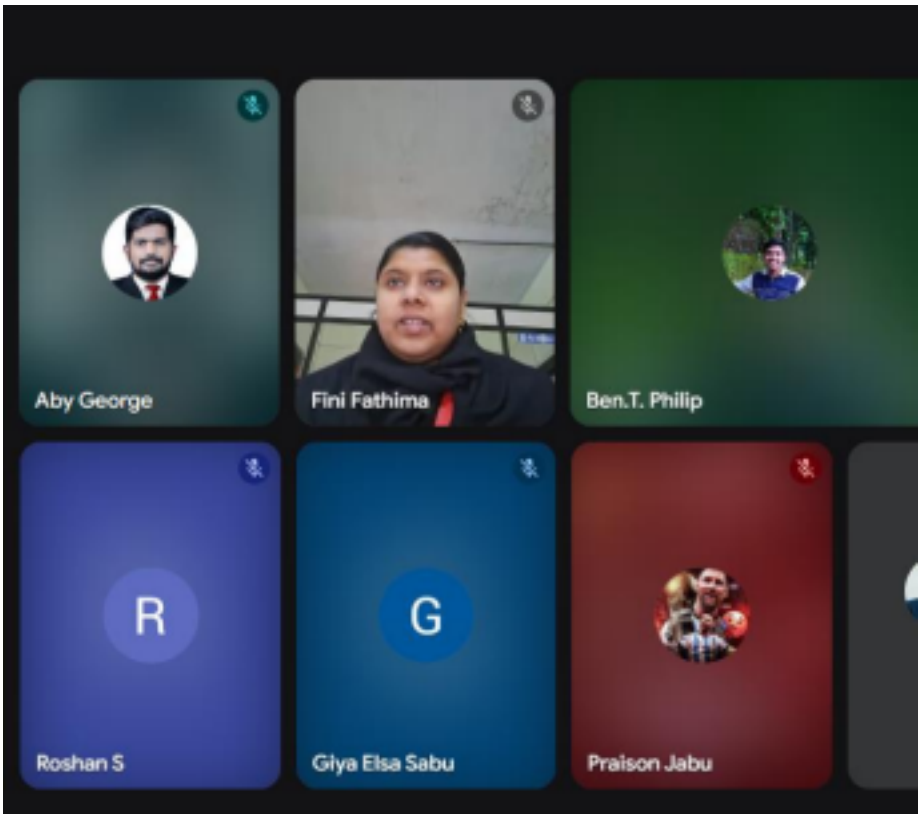
PSO1 – Design, Analyze, and Test Electrical Systems

Directly aligned with quality inspection and stability analysis of components and systems using hardware and software tools.

PSO2 – Control, Analog, and Digital System Functions

Applicable when assessing the performance and reliability of control systems and electronic circuits during inspection.

PHOTOS:


Aby George
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POSTER:

CONCLUSION

The webinar on Fault Analysis in Electric Vehicles proved to be an insightful and highly relevant session, especially in the context of the rapidly evolving electric mobility sector. It successfully bridged the gap between theoretical understanding and practical applications of fault detection and management in EV systems.

Through detailed discussions on real-world case studies, advanced diagnostic tools, and industry best practices, the session enhanced participants' awareness of the challenges and solutions related to EV faults. The expertise of the speaker

and the active involvement of attendees contributed to a dynamic learning environment.

As electric vehicles continue to shape the future of transportation, the knowledge shared in this webinar serves as a crucial step toward safer, smarter, and more reliable EV technologies. Participants left the session better equipped to contribute to innovations in EV design, maintenance, and safety engineering.