

A Short Technical Report towards A8024 – PR (P) Course

Prevention of Fire in Electric Vehicles

Submitted in the Partial Fulfillment of the
Requirements for the Award of the Degree of

BACHELOR OF TECHNOLOGY

IN

INFORMATION TECHNOLOGY

Submitted

By

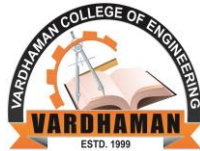
Team No.: 11

P.Vineesh	22881A12H0
P.Deepak Teja	22881A12H2
P.Varsha Sree	22881A12H3
R.Ajay Kumar	22881A12H4
R. Jyothirmai	22881A12H5
U.Shyam Sundhar	22881A12J5

Under the Esteemed Guidance of

Ms. A. Rajitha

Assistant Professor



Department of Information Technology

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

Affiliated to JNTUH, Approved by AICTE, Accredited by NAAC with A++ Grade, ISO 9001:2015 Certified
Kacharam, Shamshabad, Hyderabad - 501218, Telangana, India

2023- 24

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of the task would be put incomplete without the mention of the people who made it possible, whose constant guidance and encouragement crown all the efforts with success.

We wish to express my deep sense of gratitude to Ms. A. Rajitha, Assistant Professor for their able guidance and useful suggestions, which helped us in completing the design part of potential project in time.

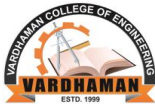
We particularly thankful to **Dr G. Suryanarayana**, Associate Professor & Head, Department of Information Technology for his guidance, intense support and encouragement, which helped us to mould our project into a successful one.

We show gratitude to our honorable Principal **Dr.J.V.R.Ravindra**, for having provided all the facilities and support.

We avail this opportunity to express our deep sense of gratitude and heartfelt thanks to **Dr Teegala Vijender Reddy**, Chairman and **Sri Teegala Upender Reddy**, Secretary of VCE, for providing congenial atmosphere to complete this project successfully.

We also thank all the staff members of **Product Realization Team** for their valuable support and generous advice. Finally, thanks to all our friends and family members for their continuous support and enthusiastic help.

P.Vineesh	22881A12H0
P.Deepak Teja	22881A12H2
P.Varsha Sree	22881A12H3
R.Ajay Kumar	22881A12H4
R. Jyothirmai	22881A12H5
U.Shyam Sundhar	22881A12J5



VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Affiliated to JNTUH, Approved by AICTE, Accredited by NAAC with A++ Grade, ISO 9001:2015 Certified
Kacharam, Shamshabad, Hyderabad - 501218, Telangana, India

Department of Information Technology

CERTIFICATE

This is to certify that the short technical report work entitled “**Prevention of Fire in Electric Vehicles**” carried out by Mr. **P.Vineesh**, Roll Number **22881A12H0**, Mr. **P.Deepak Teja**, Roll Number **22881A12H2**, Ms **P.Varsha Sree**, Roll Number **22881A12H3**, Mr. **R.Ajay Kumar**, Roll Number **22881A12H4** , Ms **R. Jyothirmai**, Roll Number **22881A12H5**, Mr. **U.Shyam Sundhar**, Roll Number **22881A12J5**, towards **A8024 – PR (P)** course and submitted to the Department of Information Technology, in partial fulfillment of the requirements for the award of degree of **Bachelor of Technology in Information Technology** during the year 2023-24.

Name & Signature of the Instructors

Ms. A. Rajitha
Assistant Professor

Name & Signature of the HOD

Dr. G. Suryanarayana
HOD, IT

Abstract

Electric vehicles (EVs) offer significant environmental benefits, but the risk of fire, primarily associated with lithium-ion batteries, poses a safety concern. Fires can result from thermal runaway, manufacturing defects, improper charging, and physical damage. This paper discusses various methodologies to prevent fires in EVs. Key recommendations include the implementation of advanced Battery Management Systems (BMS) to monitor and regulate battery conditions, the adoption of improved battery designs and materials, and stringent quality control during manufacturing. Certified charging systems and regular maintenance checks are crucial to mitigate risks associated with improper charging and physical damage. Additionally, designing crash-safe battery enclosures and providing emergency response training for first responders are essential for handling EV fires effectively. Educating consumers on safe charging practices and the importance of routine maintenance can further enhance safety. By addressing these aspects comprehensively, the safety and reliability of electric vehicles can be significantly improved, thereby promoting their wider adoption and contributing to a sustainable future.

Electric vehicles (EVs) offer substantial environmental benefits, but fire risks, primarily from lithium-ion batteries, pose significant safety challenges. This paper explores the causes of EV fires, including thermal runaway, manufacturing defects, improper charging, and physical damage from accidents. implementing advanced Battery Management Systems (BMS) to monitor and control battery conditions, improving battery design and materials, and enforcing stringent quality control during manufacturing. Certified charging systems and regular maintenance are crucial for safe operation.

LIST OF FIGURES

Fig. No.	Name of the Figure	Page No.
1.	Flow Chart	4
2.	Preventing EV Fires	5
3.	Fires by Vehicle type	6
4.	Gantt Chart	7
5.	System Architecture of Electric Vehicles	8
6.	Final Product	9

ABBREVIATIONS

Abbreviation	Expansion
SOP	Standard Operating Procedure
HVAC	Heating, Ventilation, and Air Conditioning
FDS	Fire Detection System
FES	Firer Extinguishing System
ESS	Energy Storage System
FPP	Fire Prevention Plan
EVA	Electric Vehicle Architecture
CCT	Coolant Circulation Technology

OUTLINE

	Acknowledgements	(ii)
	Abstract	(iv)
	List of Figures	(v)
	Abbreviations	(v)
1	Introduction	1
	1.1 Motivation	1
	1.2 Scope	1
	1.3 Objectives	2
	1.4 Expected Deliverables	2
2	Literature Review	3
	2.1 History	3
	2.2 Definitions(if any)	3
	2.3 Flow Diagram	3
	2.4 Applications	4
	2.5 Advantages	4
	2.6 Disadvantages	5
3	Methodology	6
	3.1 Methodology Used	6
	3.2 Gantt Chart	7
4	Purchases ,Design and Development of Product	8
	4.1 Proposed Solutions	8
	4.2 System Architecture	8
	4.3 Challenges towards Implementation	9
	4.4 Final Product	9
5	Results and Discussions	10
	5.1 Results	10
	5.2 Discussions and recommendations	11
6	Conclusion	12
7	References (Include references to books, articles, reports referred to in the report)	13-14

