IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 9, April 2025
Impact Factor: 7.67

Electric Vehicle Fire Risk Assessment using Fault Tree Analysis

Mr. Gharat Aryan Prashant[1], Mr. Dhruv Singh[2], Mr. Ankush Singh[3], Mr. Aryan Vyas[4]
Mr. Anuj Meena[5], Prof. Pravin Tathod[6]
B. Tech. scholar, Fire Technology and Safety Engineering[1-5]
Assistant Professor, Fire Technology and Safety Engineering[6]
IPS Academy, Institute of Engineering & Science, Indore, India
Author for correspondence: Mr. Pravin Tathod,
pravintathod@ipsacademy.org

Abstract: *Soon, the rapid adoption of electric vehicles is inevitable, driven by environmental concerns and climate change awareness. However, this progressive trend also brings forth safety concerns and hazards, notably regarding the risk of EV fires, which have garnered significant media attention. This necessitates the need to study for comprehensive fire risk assessment strategies aimed at preventing and mitigating such incidents.*

Through this approach, the work discerned five major causes: human factors, vehicle factors, management factors, external factors, and unknown factors. Using a meticulous weighted average approach, the annual EV fire frequency for each country was deduced, revealing an average annual EV fire rate of 2.44 × 10-4 fires per registered EV. This metric provides a significant benchmark, reflecting both the probability and inherent risk of such incidents.

As EV adoption surges, this study underscores the importance of comprehensive, data-driven insights for proactive risk management, emphasizing the necessity for vigilant and adaptive strategies. The findings emphasize the pivotal role of this assessment in shaping response strategies, particularly for first responders dealing with EV fires. In essence, this research not only elevates the understanding of EV fire risks but also offer a foundation for future safety measures and policies in the domain

Keywords: Electric vehicle

DOI: 10.48175/IJARSCT-25722