

REVIEWER'S REPORT

Manuscript No.: IJAR-59470

Title: An Integrated Framework for Lifecycle Safety Management and Assurance of Rechargeable Lithium Batteries for Military Applications: A Comparative Analysis of Industrial, Military, and Space Safety Documents"

Recommendation:

Accept

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality		Yes		
Clarity	Yes			
Significance		Yes		

Reviewer's ID: JPR- 015

Detailed Reviewer's Report

Reviewer's Comment for Publication.

Acceptance Comment are mentioned below suitable for the paper titled "An Integrated Framework for Lifecycle Safety Management and Assurance of Rechargeable Lithium Batteries for Military Applications: A Comparative Analysis of Industrial, Military, and Space Safety Documents"

Reviewer Comments: Accept

Reviewer Comments –

1. Introduction

The introduction should establish the growing importance of rechargeable lithium batteries in military platforms and the associated challenges of managing safety throughout their operational lifecycle. The risks associated with battery design, testing, transportation, handling, operation, incident response, and end-of-use management should be clearly explained. The need to harmonize requirements across industrial, military, and space safety documents should be highlighted. The motivation for developing an integrated lifecycle safety management and assurance framework should be explicitly stated. The introduction should conclude by identifying the research objectives and the anticipated contribution to military battery safety management.

2. Literature Review

The literature review should discuss existing research on lithium battery safety, lifecycle risk management, military engineering assurance, and safety standards for aerospace and industrial applications. Relevant studies on battery qualification, configuration management, operational monitoring, incident response, and disposal practices should also be considered. The authors should

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examine the similarities and differences between industrial safety requirements and the more specialized assurance needs of military and space applications. Particular attention should be given to limitations arising from fragmented documentation and inconsistent requirement structures. This review would establish the research gap addressed by the proposed integrated framework.

3. Solution Approach / Methodology

The structured comparative document analysis provides an appropriate methodological foundation for developing the proposed framework. The inclusion of 14 safety documents enables a systematic assessment of requirements across industrial, military, space, and operational contexts. Organizing the requirements into seven lifecycle domains and 23 detailed elements offers a clear structure for comparing document coverage. The identification of five safety assurance mechanisms further distinguishes lifecycle safety objectives from the processes used to verify, approve, and trace compliance. Overall, the methodology provides a systematic and potentially transferable approach to integrating dispersed safety requirements into a unified assurance framework.

4. Results and Discussion

The results provide useful quantitative insights into the distribution of safety requirements across the reviewed documents. The high coverage of general provisions, operational requirements, and marking and information provision highlights the emphasis placed on fundamental safety practices. The comparatively lower coverage of safety performance requirements identifies an important area for further consideration in battery safety assurance. The integration of lifecycle domains with five assurance mechanisms provides a valuable structure for requirement verification, configuration management, and continuous improvement. The findings have practical implications for platform-specific gap analysis, technical guidance development, and systematic review of military battery safety requirements.

5. Conclusion

The manuscript makes a meaningful contribution by proposing an integrated framework for lifecycle safety management and assurance of rechargeable lithium batteries in military applications. The comparative analysis provides a structured understanding of common requirements and differences across industrial, military, and space safety documents. The resulting framework supports improved requirement organization, traceability, verification, and platform-specific safety assessment. Its emphasis on operational monitoring and post-use evaluation also encourages continuous improvement throughout the battery lifecycle. The study offers a useful foundation for future development of requirement databases, standardized assessment procedures, and more comprehensive military battery safety guidance.