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REVIEWER'S REPORT

Manuscript No.: IJAR- 58447

Title: ETAP BASED LOAD FLOW AND SHORT-CIRCUIT ANALYSIS OF A 42 M FAST CREW BOAT ELECTRICAL POWER SYSTEM UNDER PEAK LOADING CONDITIONS

Recommendation:
Accept

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

Reviewer Name: Dr. Ashish Yadav

Detailed Reviewer's Report

Reviewer's Comment for Publication.
Acceptance Comments are mentioned below suitable for the paper titled "ETAP BASED LOAD FLOW AND SHORT-CIRCUIT ANALYSIS OF A 42 M FAST CREW BOAT ELECTRICAL POWER SYSTEM UNDER PEAK LOADING CONDITIONS"

Reviewer Comments: Accept

Reviewer Comments –

1. Introduction

The introduction clearly outlines the importance of reliable electrical power distribution in marine vessels, particularly during peak operating conditions such as arrival and departure manoeuvres. The motivation for using ETAP as a simulation tool is well established, and the objectives of evaluating load flow and short-circuit performance are clearly stated. The manuscript effectively emphasizes the need for compliance with international marine electrical standards to ensure operational safety and reliability. Overall, the introduction provides sufficient technical background and justifies the significance of the research.

2. Literature Review

The literature review adequately discusses previous studies on marine electrical power system design, load flow analysis, and fault current assessment using simulation software. The review identifies ETAP as a widely accepted platform for electrical system modelling and highlights the importance of IEC and

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SOLAS standards in marine applications. The authors successfully identify the gap in validating conventional design calculations through simulation-based verification for fast crew boats. Including a few recent references on digital ship power systems and smart marine energy management would further strengthen the review.

3. Solution Approach

The proposed methodology is systematic, technically appropriate, and well aligned with the study objectives. The electrical network of the fast crew boat is modelled in ETAP, and load flow analysis is performed using the Newton-Raphson algorithm under peak loading scenarios. Short-circuit analysis is conducted to determine fault current levels and verify the adequacy of protective devices. The comparison between analytical calculations and ETAP simulation results provides an effective validation framework and demonstrates the robustness of the proposed design approach.

4. Results and Discussion

The results are presented clearly with appropriate engineering interpretation. The load flow analysis confirms that the optimized 250 kW generator operates at approximately 82.1% loading during peak demand, indicating sufficient operational reserve and reliable system performance. The short-circuit analysis demonstrates that the maximum fault current of approximately 4.8 kA remains within the interrupting capability of the selected protection devices. The close agreement between manual calculations and ETAP simulations, with deviations below 10%, validates the modelling methodology and enhances confidence in the proposed electrical system design.

5. Conclusion

The conclusion effectively summarizes the major contributions of the study and confirms the suitability of ETAP for analysing marine electrical power systems under peak operating conditions. The integration of conventional engineering calculations with simulation-based verification provides a reliable and practical framework for electrical system design and validation. The study demonstrates compliance with international marine standards while ensuring voltage stability, generator reliability, and adequate fault protection. The findings offer valuable insights for marine electrical engineers involved in vessel design and power system optimization.