ISSN: 2320-5407



International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

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REVIEWER'S REPORT

Manuscript No.: IJAR-51270

Date: 28-04-2025

Title: WIND ANALYSIS OF STEEL TRANSMISSION TOWER USING DIFFERENT BRACING SYSTEMS

Recommendation:	Rating	Excel.	Good	Fair	Poor
Accept as it isYES	Originality				
Accept after minor revision	Techn. Quality				
Do not accept (<i>Reasons below</i>)	Clarity				
	Significance				

Reviewer's Name: Tahir Ahmad

Reviewer's Decision about Paper:

Recommended for Publication.

Comments (Use additional pages, if required)

Reviewer's Comment / Report

Overall Evaluation:

The manuscript focuses on the wind analysis of steel transmission towers with an emphasis on evaluating the performance of different bracing systems (X, inverted-V, and W bracings) under wind load. The study presents a clear analysis of the wind responses of a transmission tower subjected to wind loads in the Delhi and Bhopal regions. The results indicate that W bracing is the most effective system for reducing wind responses compared to X and inverted-V bracings. The evaluation of bending moments, shear forces, displacements, and steel take-off adds substantial value to the understanding of the bracing system's influence on the structural behavior of transmission towers.

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Strengths:

- Clear Objective and Scope: The manuscript clearly defines the scope of the study, which aims to assess the effectiveness of various bracing systems in mitigating wind load-induced responses in transmission towers. The objective is well-aligned with the current challenges in optimizing tower design for wind resilience.
- Relevant Methodology: The study uses standard methods to assess the wind load effects on transmission towers, employing bending moment, shear force, displacement, and steel take-off as key parameters. This approach ensures that the analysis is comprehensive and captures critical structural responses.
- **Comprehensive Literature Review:** The related work section effectively summarizes past research in transmission tower design and wind load analysis. It references a wide range of studies, demonstrating a strong understanding of the existing body of knowledge and the relevance of the current study within the context of previous work.
- Practical Relevance: The findings are practically significant for improving the design of transmission towers. By identifying the W bracing system as the most effective in reducing wind responses, the study provides valuable insights for optimizing tower designs in regions with high wind loads.
- Solid Conclusion: The manuscript concludes by emphasizing the importance of selecting the right bracing system for reducing wind responses and contributes to ongoing efforts to improve transmission infrastructure. This aligns well with the objectives of the study.

Specific Observations:

- Abstract: The abstract effectively summarizes the key points of the study, including the objective, methodology, results, and contributions of the research. It provides a succinct overview of the findings and the significance of the W bracing system in reducing wind-induced stresses on the tower.
- Introduction: The introduction provides a clear background on the importance of transmission towers in power distribution networks and the challenges associated with wind load. It highlights the necessity of optimizing tower design for wind resilience, which is crucial for ensuring the safety and reliability of power transmission systems.
- **Methodology:** The methodology section is well-structured, outlining the specific types of bracing systems tested and the wind load conditions applied. However, the study could

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benefit from a more detailed explanation of the analytical or computational methods used to evaluate the tower responses (e.g., software used, boundary conditions, etc.).

- **Results and Discussion:** The results are clearly presented, with a comparison of the wind responses for each bracing system. The discussion section is thorough and effectively interprets the results, focusing on the superior performance of the W bracing system in reducing wind-induced stresses. However, it could further elaborate on the specific advantages of W bracing in terms of material savings or long-term durability.
- **Conclusion:** The conclusion effectively reinforces the findings of the study, emphasizing the effectiveness of the W bracing system. It provides a strong message about the importance of optimizing bracing systems for improved structural performance, particularly in regions prone to high wind loads.

Relevance:

This study is highly relevant to current structural engineering practices, particularly in the design of transmission towers exposed to wind loads. The optimization of tower design through the use of effective bracing systems is essential for improving safety and reducing maintenance costs. The results have significant implications for engineering practices in regions with varying wind conditions, contributing to the development of more resilient power distribution infrastructure.