

REVIEWER'S REPORT

Manuscript No.: IJAR-54421

Date: 22-10-2025

Title: Quality analysis of high-voltage network in Niamey city.

Recommendation:

Accept as it is

Accept after minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

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

Reviewer Name: Mr. Bilal Mir

Reviewer's Comment for Publication.

The manuscript "*Quality Analysis of High-Voltage Network in Niamey City*" presents a detailed technical evaluation of the **reliability, availability, and harmonic performance** of the high-voltage (HV) distribution system in Niamey, Niger. The study combines **statistical data analysis, reliability modeling, and harmonic measurement** to assess the quality and resilience of the city's electrical network between 2022 and 2024.

The research topic is both **original and significant**, especially given the rapid urbanization and the increasing pressure on Niger's electrical grid. The authors effectively describe the structure of the HV network, its operational characteristics, and the dominant causes of disruptions—particularly the dependence on the 132 kV interconnection line from Nigeria. The use of **quantitative reliability indices (SAIDI, SAIFI, MTBF, MTTR)** and **harmonic distortion analysis (via CA-8220 analyzer)** adds technical rigor and relevance.

The results clearly demonstrate the **declining reliability after 240 hours of operation** and provide an evidence-based evaluation of network availability and losses due to undistributed energy. The harmonic measurements are within acceptable limits, confirming that most transformer substations are not yet affected by excessive harmonic pollution. The study's recommendations

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for continuous harmonic monitoring and maintenance planning are both **practical and applicable** for electrical utilities in West Africa.

Strengths

- Comprehensive quantitative analysis using real operational data.
- Effective use of reliability and quality indices.
- Clear presentation of results through tables and figures.
- Policy and technical relevance to grid management in developing regions.

Weaknesses / Minor Revisions Required

1. **Language and formatting:** Some grammatical and typographical corrections are needed for smoother readability (e.g., spacing, punctuation, consistent use of units such as “kV” and “MWh”).
2. **Figures and tables:** Ensure all figures (especially 2–9) are properly captioned, numbered, and referenced in the text in sequential order.
3. **Discussion depth:** Expand briefly on how the calculated reliability indices compare to international standards or similar African networks.
4. **Conclusion section:** Strengthen by summarizing key numerical findings (e.g., SAIDI = 34 hours, SAIFI = 25 interruptions) and linking them directly to maintenance and policy implications.
5. **Reference list:** Some entries lack proper citation formatting; ensure all references follow a uniform style (APA or IEEE).

Overall Evaluation

This paper offers a **valuable contribution** to the study of electrical network reliability and quality assessment in sub-Saharan Africa. Its methods and findings are **technically sound** and provide actionable insights for grid maintenance, reliability improvement, and future energy planning.