

## REVIEWER'S REPORT

Manuscript No.: IJAR-53218

Date: 11-08-2025

**Title:** IDENTIFICATION DES NŒUDS CRITIQUES DU RESEAU HAUTE ET MOYENNE TENSION (HT ET MT) DE LA VILLE DE N' DJAMENA

### Recommendation:

**Accept as it is .....YES.....**

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 study titled *Identification des nœuds critiques du réseau haute et moyenne tension (HT et MT) de la ville de N'Djamena* addresses an important aspect of power system operation—voltage stability and reactive power management—within the SNE electrical network. The abstract and résumé clearly outline the research objective, methodology, and findings, presenting a concise overview of the technical approach.

The problem statement is grounded in the real-world context of increasing electricity consumption driven by industrialization, urbanization, and population growth. The authors correctly highlight the role of inductive and capacitive characteristics of loads and transmission lines in contributing to voltage instability. This contextual framing aligns well with the current challenges faced by developing power grids, particularly in African urban centers.

The methodology, centered on the Newton–Raphson load flow method, coupled with voltage–reactive sensitivity analysis ( $\Delta U/\Delta Q$ ), and QU and PU curve assessments, is technically appropriate for identifying weak nodes in a power network. The choice of indicators, such as sensitivity values and the slope characteristics of the curves, provides quantitative and visual means to classify nodes by stability level.

The results are clearly presented, with specific sensitivity values for nodes T100 and LAM. The interpretation linking slope steepness and stability level is straightforward and technically sound. The designation of T100 as a critical node, followed by LAM as moderately stable, demonstrates effective application of the analysis tools. The conclusion that the remaining nodes are stable offers a complete stability mapping for the network.

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The introduction situates the research within the broader context of power system stability challenges, referencing relevant drivers of instability. The inclusion of literature citations [1], [2], [3] supports the credibility of the discussion. The language maintains a technical tone consistent with engineering research, and the bilingual abstract ensures accessibility for both French- and English-speaking audiences.

Overall, the work effectively combines theoretical analysis with practical application to a specific power network, contributing valuable insights into voltage stability assessment and critical node identification in high- and medium-voltage systems.