

REVIEWER'S REPORT

Manuscript No.: IJAR-59466

Title: Real-Time Partial Discharge Monitoring as an Early-Warning System for Smart GIS Substations in Saudi Arabia: Preventing Failures and Improving Grid Resilience.

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 Id: JPR-297

Reviewer's Comment for Publication.

The manuscript addresses an important topic concerning real-time partial discharge monitoring for gas-insulated switchgear (GIS) substations and its potential contribution to grid reliability and resilience in Saudi Arabia. The review provides a comprehensive discussion of electromagnetic, acoustic, optical, and gas-based sensing technologies, along with defect localization, machine learning, sensor reliability, cybersecurity, and maintenance decision-making. The proposed framework effectively distinguishes signal detection from defect diagnosis and emphasizes the importance of uncertainty-aware alarms and field validation. However, the following minor revisions are recommended:

1. Clarify the literature search strategy, including the databases searched and the criteria used for selecting studies.
2. Improve the comparative analysis of sensing technologies by providing more specific evidence from the reviewed studies.
3. Strengthen the discussion of Saudi-specific operating conditions with relevant supporting evidence.
4. Ensure that all references are complete, consistent, and correctly formatted.
5. Improve the presentation and readability of the figures and tables, ensuring that they are clearly integrated into the manuscript.
6. Further emphasize the practical limitations of the proposed framework and the need for prospective field validation.

Overall, the manuscript is well organized, technically relevant, and potentially valuable to researchers and power-system professionals. It makes a useful contribution by linking partial discharge monitoring with maintenance decisions and measurable resilience outcomes. **The manuscript is recommended for acceptance after minor revision.**