

REVIEWER'S REPORT

Manuscript No.: IJAR-59220

Title: AI-Assisted Hydrocarbon Leakage Detection and Incident Prevention in Saudi Arabia: Advancing Environmental Protection under Vision 2030.

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-364

Reviewer's Comment for Publication.

The manuscript addresses a timely and significant topic by reviewing AI-assisted hydrocarbon leakage detection and incident prevention using pressure-flow analytics, acoustic emission, distributed optical-fiber sensing, infrared imaging, drones, corrosion prediction, and hybrid AI approaches. The manuscript is well organized and provides a useful discussion of the challenges associated with false alarms, limited field data, environmental conditions, model uncertainty, and deployment in Saudi Arabia. The proposed layered architecture and Vision 2030-oriented implementation framework are relevant and potentially valuable for researchers and industrial practitioners. Minor revisions are recommended to improve the transparency of the review methodology, clarify the distinction between leak detection and demonstrated incident prevention, strengthen the Saudi-specific evidence, improve the presentation of Tables 1 and 2, clarify validation and uncertainty requirements, and ensure consistent terminology and formatting throughout the manuscript. The authors should also conduct a final proofreading and citation check. Overall, the manuscript is suitable for publication after minor revision.