

## ABSTRACT

*Earthquakes are a natural disaster that occur frequently in Yogyakarta. The earthquake point through Yogyakarta in 2006 was near the Opak Fault. The Opak Fault is an active fault that is frequently the source of earthquakes. Repairs to damaged pipes and failed connections are time consuming and costly in the event of a disaster. From the perspective of risk management, it is very important to evaluate the vulnerabilities of the distribution system network facilities. Seismic vulnerability analysis and pipeline performance evaluation can provide appropriate and effective mitigation strategies. It can also be considered in pipeline rehabilitation..*

*This study uses a method that begins with analysis and summary of criteria and sub-criteria. The criteria, sub-criteria, and pipeline vulnerability score ranges are based on previous research and applicable regulations. Furthermore, several stakeholders/experts, including PDAM expert workers, academics, and government agency representatives, were involved in determining the criteria, sub-criteria, and vulnerability score ranges. The first questionnaire was distributed to obtain information from experts. The following step is to distribute the second questionnaire, which compares the criteria and sub-criteria to be analyzed in calculating the Analytic Hierarchy Process (AHP). The weighting for each criterion and sub-criterion is calculated using the SVI-WDN formula as a result of the AHP. This latest results are based on a number of criteria, including three criteria and fourteen sub-criteria. This assessment includes physical, environmental, and operational criteria. The results of using AHP to calculate the criteria weight are 47% physical criteria weight, 34% environmental, and 19% operational. The sub-criteria with the highest weight percentage are pipe age and earthquake intensity (15%), while the sub-criteria with the lowest weight percentage are water quality and discontinuity (2%). The visualization created with the 2006 earthquake scenario, namely MMI VII, is the end result of this research. The visualization shows that the majority of the pipes are moderately vulnerable (vulnerability score range 4) and vulnerable (vulnerability score range 5).*

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**Keyword :** Earthquake, SVI-WDN, vulnerability Index, Distribution Pipe, Risk Analysis .