

To Study Machine Learning Enabled Steady – State Security Predictor as Deployed For Distribution Feeder Reconfiguration

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Abstract: *The distribution network is reconfigured by modifying the topology arrangement of the network feeders. Because the voltage stability of the distribution networks can differ within a range following network reconfiguration, the calculation of steady-state voltage stability plays a significant role in real time feeder reconfiguration, Examining the state of security and estimating it for the next operational configuration is crucial for making real-time decisions. Online security evaluation needs minimal complexity and computing time. Standard methods of assessing the distribution network's steady-state voltage stability can be insufficient for online and real time environments due to their high complexity and long computing period. This study proposes a machine learning (ML) approach for classifying configuration states and adopts the decision tree technique to interpret the online applications in the feeder reconfiguration. For the classification, the single line equivalent L index voltage stability and switching configurations of the feeders are employed as training information for the ML models. A modified IEEE 14-bus and 30-bus test systems verifies the feasibility of the suggested solution. Once trained, the proposed system provides a quick and accurate classification for unknown configurations of the specific security state in 0.3 seconds.*

Keywords: Distribution Network

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