Optimal placement of phasor measurement units considering islanding contingency, communication infrastructure, and quality of service

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Abstract

In this study, the PMUs are placed to operate in normal and islanded cases taking into account power systemobservability, reliability, Communication Infrastructure (CI), and latency time associated with this CI. Moreover,the economic study for additional new data transmission paths is considered as well as the preexistingCommunication Devices (CDs) and the availability of predeýned locations of some PMUs in some buses. ThePMUs placement and their communication network topology and link channel capacity are co-optimized simultaneously. Two different approaches are applied to optimize the objective function; the ýrst approach is combinedfrom Binary Teaching Learning Based Optimization Algorithm (BTLBOA) and the Minimum Spanning Tree (MST)algorithm, while the second approach is based on BTLBOA. The proposed approaches are examined using IEEE118-bus systems

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