

INTEGER LINEAR PROGRAMMING BASED OPTIMAL PMU PLACEMENT IN LARGE POWER NETWORK BASED ON TOPOLOGICAL AND OPERATIONAL CONSIDERATIONS

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ABSTRACT

This paper focuses on the problem of optimal placement of the PMU (Phasor Measurement Unit) in a large power network.

Optimal PMU placement has multiple solutions depending upon the consideration of constraints and therefore consideration of field based topological and operational criteria can give better and actual result. This has been carried out using integer linear programming with the consideration of different types of criteria such as, zero injection measurement, cost constraint, voltage level, future expansion, bus location in the network, owner of the substation, centre of load point, availability of communication link, connection with generating station and evaluation based on system operating condition. Different indices like BOI (Bus Observability Index), SORI (System observability Redundancy Index) and System Operating conditions are also being considered for determination of location at which PMU can be installed to achieve full network observability. It has been clearly visualized change in location of PMU in cases of with and without consideration of said criteria.

KEYWORDS: Phasor Measurement Unit(PMU), Integer Linear Programming(ILP), Optimal PMU Placement(OPP), System Observability Redundancy Index (SORI), Bus Observability Redundancy Index(BORI)