

Enhanced State Estimation by Advanced Substation Monitoring

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Objectives

Utilize advanced instrumentation and computing power available at the substations, in order to:

- detect/identify topology errors
- correct state estimation for phase imbalances
- tune measurement weights

Proposed Work

- Topology error detection / identification
 - Utilize substation measurements that are not directly used by topology processor
 - Use the detailed substation model to verify topology with respect to measurements
 - Detect and identify topology errors locally

Proposed Work

- Phase imbalance
 - Detect unbalanced phase flows
 - Correct the model and/or measurements to account for the unbalance
- Tuning of measurement weights
 - Determine drifts and biases in the meters
 - Adjust weights via time series analysis of the measurement errors for individual meters

Significance

- Existing work on processing of measurements (analog and CB status) at the control center
- Exploit the capability of digital instrumentation at the substations to enhance state estimator's performance and reliability

Deliverables

- Prototype programs
 - Topology error identification
 - Correcting for phase unbalances
 - Automatic tuning of weights
- Report describing project results