Detecting Topological Errors with Pre-Estimation Filtering of Bad Data in Wide-Area Measurements

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It is expected that bad data and missing topology information will become an issue of growing concern when power system state estimators are to exploit the high measurement reporting rates from phasor measurement units. This paper suggests to design state estimators with enhanced resilience against those issues. The work presented here include a review of a pre-estimation filter for bad data. A method for detecting branch status errors which may also be applied before the state estimation is then proposed. Both methods are evaluated through simulation on a novel test platform for wide-area measurement applications. It is found that topology errors may be detected even under influence of the large dynamics following the loss of a heavily loaded branch.

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Contributors: Møller, J. G., Sørensen, M., Jóhannsson, H., Østergaard, J.
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