MODIFIED ELECTRIC POWER SYSTEM STATE ESTIMATION –

MULTI- PROCESSING TECHNIQUE

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ABSTRACT

Estimating the state of the power system in Real time is a challenging task, mainly because, solving the non-linear large power system equations by iterative solution comsumes huge computational time and memory. Online Energy Management System (EMS) these state estimators need to Estimate the state of the system at very short intervals. Conventional methods like Newton-Raphson is not suitable for such real time application.

To improve the performance of SE, certain techniques like AI, Real time, Hirarchial and Dynamic methods are listed in reference [1][4][5][11][12][13]. The most common "Two-Level" SE technique is applied by spliting the large power system in to sub-networks and each sub-networks are managed by the local control station in coordination with the Centre station – [2][3][7][8][9][14]. Even though it reduces the computational time, still it is not suitable for real time applications. In the "Two-Level SE" mainly same NR method is used, however, before applying the NR technique, the electric network is physically divided, which results to mathematical approximation.

This paper presents an approach to solve the problem in hand without physically dividing the network and/or any approximation on the existing NR method. Single large mathematical problem can be divided into smaller independent parallel task by changing the multiplication method of large sparce jacobian matrix. This leads to a whole new approach resulting in reducing in computing time as well as dynamic memory requirement.

KEYWORDS: **SE**-State Estimation, **WLS**-Weight Least Square, **RTU**-Remote Terminal Unit, **NR**-Newton Rapson, **AI**-Artificial Intelligence, **Node Area**-A Node along with its Connected Node is Referred as Node Area