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Toward On-Line SuperOPF Solvers and its Practical Applications

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Abstract

Robust OPF (optimal power flow) solvers, if properly developed, can enhance energy efficiency of power networks, increase network power transfer capability, while support higher renewable penetration, and maintain power system security. Optimal Power Flow (OPF) is difficult to solve, due to its complexity in multiple aspects; especially its non-linear optimization, AC power flow formulation and the difficulty in expressing power system stability constraints. To avoid this complexity many utilities adopt simplified formulations, apply linear programing techniques to solve a linearized OPF problem, or apply local or heuristic controls to solve simplified OPF problems. This approximated and simplified OPF approach has several serious issues to be addressed. Over the past several years, the commercial-version SuperOPF has been developed for solving realistic OPF problems without the approximation and simplification. Super-OPF adopts several transformational technologies developed by BSI for on-line environment and interface directly with the EMS of major utilities, RTOs and ISOs. It will be shown that, using practical utility data, significant OPF solutions and great improvements (as many as 40%) of the OPF objective value can be obtained and the stability constraints can be fully respected: This talk will present some practical applications of SuperOPF in on-line operational environments.