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Computational Intelligence – Research and Development in Power Industry

To me, Computational Intelligence (CI) is the easiest and efficient way to solve a complex problem. CI research community is doing great job today. Researchers publish significant number of articles on CI every year. Therefore, applications of CI method in power system are increasing day by day. When a complex problem cannot be solved by a traditional method, usually CI comes into the picture. After increasing computational power and available sensory big data, users want to model their power systems in detail using GIS, etc. A distribution system is an example. Such large online systems cannot be handled efficiently using traditional methods. Power industries are looking fast methods to run all power studies for planning, simulation, analysis, operation and control of T&D systems, e.g., unbalanced optimum power flow (OPF), unbalanced state and load estimation, non-linear dynamic parameter estimation (motor, PSS), monitoring, optimization, and control, centralized and distributed control, etc. are named only few. Today we usually solve non-linear problems by linearization with sacrificing accuracy in traditional methods. CI is the solution for all of those challenges. CI can handle non-linearity without any limitation. However, Power industries have lack of trained people on CI. Moreover, CI benchmark systems and standards are not available for validation. Thus CI is being implemented on power industries slower than expected. It is right time to pay attention on methods, standards and regulations of CI for power system to get a sustainable power and energy system.