Comprehensive Congestion Management for Distribution Networks based on Dynamic Tariff, Reconfiguration and Re-profiling Product

This paper proposes a comprehensive scheme for day-ahead congestion management of distribution networks with high penetration of distributed energy resources (DERs). In the proposed scheme, the dynamic tariff (DT), network reconfiguration and re-profiling products are integrated, which combines the advantages of these methods. In addition, the previously proposed DT model is relaxed in order to handle possible infeasibility of the DT problem and set a limit for the DT. With the utilization of the flexibilities from various types of DERs and the advantages of the three congestion management methods, the proposed comprehensive scheme can solve the congestion more effectively and at the same time ensures that the congestion management prices are within an acceptable level. Three case studies were conducted with the modified Roy Billinton Test System (RBTS) to validate the effectiveness and advantages of the proposed comprehensive scheme.