

Automated Distribution System Management: Substation Remote Diagnostic and Operation Solution for Obafemi Awolowo University

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Abstract : This paper gives information about the wide array of challenges facing both the electric utilities and consumers in the distribution system in developing countries, using Obafemi Awolowo University, Ile-Ife Nigeria as a case study. It also proffers cost-effective solution through remote monitoring, diagnostic and operation of distribution networks without compromising the system reliability. As utilities move from manned and unintelligent networks to completely unmanned smart grids, switching activities at substations and feeders will be managed and controlled remotely by dedicated systems hence this design. The Substation Remote Diagnostic and Operation Solution (sRDOs) would remotely monitor the load on Medium Voltage (MV) and Low Voltage (LV) feeders as well as distribution transformers and allow the utility disconnect non-paying customers with absolutely no extra resource deployment and without interrupting supply to paying customers. The aftermath of the implementation of this design improved the lifetime of key distribution infrastructure by automatically isolating feeders during overload conditions and more importantly erring consumers. This increased the ratio of revenue generated on electricity bills to total network load.

Keywords : electric utility, consumers, remote monitoring, diagnostic, system reliability, manned and unintelligent networks, unmanned smart grids, switching activities, medium voltage, low voltage, distribution transformer

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