

RELIABILITY EVALUATION IN ELECTRICAL POWER DISTRIBUTION SYSTEM FROM GEOREFERENCED DATABASE

Simone Aparecida Miloca

State University of West Paraná - UNIOESTE
Rua Universitária, 2069, Jd. Universitário, Cascavel-Pr, Brazil
smiloca@gmail.com

Neida Maria Patias Volpi

Federal University of Parana - UFPR
Curitiba – PR, Brazil
neidavolpi@gmail.com

Cleverson Luiz da Silva Pinto

Energy Company of Parana – COPEL
Curitiba – PR, Brazil
cleverson@copel.com

Jinyun Yuan

Federal University of Parana – UFPR
Curitiba – PR, Brazil
jin@ufpr.br

Marcos Anselmo Ribeiro

Energy Company of Parana – COPEL
Curitiba – PR, Brazil
mribeiro@copel.com

ABSTRACT

This work presents a hybrid method for obtaining estimates of reliability indices in electric distribution networks using information directly from a georeferenced database of Geographic Information System (GIS). Faults that occur in the system may impair its operation and paralyze the power supply to final consumers, so it is important to analyze the reliability. In the electrical system this can be done through indexes defined for the system, usually established by agencies responsible for monitor, regulate and supervise the activities of energy. In Brazil, this organ is the National Electric Energy Agency - ANEEL. In this work it is proposed a hybrid method to obtain such indices using Monte Carlo simulation, the algorithm is implemented and inserted into an application with a friendly interface allowing the communication between georeferenced database and algorithm in order to generating, analyzing and presenting numerical results and graphs. Using data from the GIS it is possible the manager to obtain estimates of reliability indices not only current network but also future network because, by modifying the network topologically with the expansion of the system or adding new components, the reading of these data can be performed and estimates of reliability indices obtained. The use of application produces a reduction of the effort for obtaining and processing the data to increase the speed and accuracy of results, facilitating the development of the analysis by planners of the Company. A real network is used as an example and numerical results are presented. This work is part of a project P&D: Expansion of Distribution System Considering Reliability Criteria developed by UFPR - Federal University of Paraná and COPEL - Energy Company of Parana.

PALAVRAS CHAVE. Reliability, Electrical Networks, GIS.

Main area: EN - PO in Energy.