

Resumo

As principais motivações que um projectista tem quando projecta uma rede eléctrica, são a qualidade de serviço e o factor económico. Geralmente as redes são projectadas usando-se soluções robustas e caras, ou o caso oposto: soluções com uma fraca qualidade de serviço.

Normalmente existe a sensibilidade de que, considerar as cargas como 100% de potência constante não é a melhor solução. Mas na maior parte dos casos não há informação suficiente para incluir, no projecto, a dependência que as cargas têm da tensão.

Neste trabalho faz-se uma pesquisa sobre os artigos publicados á cerca da modelização de cargas, classificam-se esses artigos de acordo com os assuntos tratados e comentam-se alguns deles. Simulam-se depois alguns desses modelos de cargas, usando-se o método de Newton-Raphson e comparam-se os resultados entre os modelos de carga de potência constante e os modelos de carga dependente da tensão.

Como a maioria dos modelos usados são determinísticos, não incluem o impacto da incerteza. Por isso usa-se depois, neste trabalho, o Fluxo de Potências Difuso para analisar o efeito da incerteza das cargas e verificam-se as diferenças entre essa solução e o uso de geração aleatória de potência de carga.

Abstract

This work is related to issues studied in the disciplines of Computing Methods of Electrical Systems Analysis, Planning Methods of Electrical Systems and Dynamic and Stability of Electrical Systems, of the Master Course in Elettrotechnical and Computing Engineering in the area of Power Systems.

This work was realized by suggestion of Prof. Ron Herman and Prof. Vladimiro Miranda and it had as departure point, the matters studied in the classes of Dynamic and Stability of Electrical Systems, lectured by Prof. Ron Herman, who has given the initial orientation to the start up of this study.

The development of the work was then done with the support of Prof. Vladimiro Miranda, having used the Power Flow and the knowledge acquired in the classes of Computing Methods of Electrical Systems Analysis and of Planning Methods of Electrical Systems. An attempt was also made on a Three-Phase Power Flow, which ran with the cases that excluded P-V buses, but the results in the general case had a very slow convergence which means that they were not correct and therefore it was not considered in this work. The objectives of including the voltage dependent loads in the deterministic Power Flow as well as in the Fuzzy Power Flow were accomplished.

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The author dedicates this work to his family, who had a great comprehension during the time of preparation of this thesis and of the master course.