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电力系统

考虑发电机励磁电流限制的改进连续潮流算法

刘楠 印永华 马世英 刘涛

中国电力科学研究院，北京市 海淀区 100192

摘要：

连续潮流法是静态电压稳定分析中强有力的方法和工具。常规的连续潮流程序中，使用发电机无功出力最大值Qmax近似表征其无功出力限制。在实际系统中，发电机的无功出力受制于励磁电流的调节能力。从稳态角度出发，提出了使用发电机内电势Eq近似表征无功出力限制的处理方法，建立了考虑励磁电流限制的静态电压稳定分析模型，并提出改进的连续潮流算法。该算法在考虑发电机无功出力最大值Qmax的基础上，将无功出力达到最大值的节点视为有功、内电势恒定(P-Eq)节点。该节点根据有功出力、功角值以及机端电压对校正环节中的无功出力进行修正，更好地模拟了发电机在励磁电流限制下的无功特性。IEEE-30节点系统仿真结果证明了该方法的可行性和实用性。

关键词：

An Improved Continuation Power Flow Algorithm Considering Generator Excitation Current Limit

LIU Nan,YIN Yonghua ,MA Shiying , LIU Tao

China Electric Power Research Institute, Haidian District, Beijing 100192, China

Abstract:

Continuation power flow (CPF) is a powerful analytical methodology and tool in static voltage stability analysis. Engineer may use P-V method for general voltage stability evaluation, contingency screening, etc. The benefits of this methodology is that it provides an indication of proximity to voltage collapse throughout a range of load levels or interface path flows for the simulated system topology. The reactive power resources are needed to supply the requirements of customer demands and the reactive power losses in the transmission and distribution systems, and provide adequate system voltage support and control. Therefore, the modeling of generator reactive power limit is very important in CPF. The reactive power characteristic under generator excitation current limit were discussed; Based on the former generator reactive power limit treatment, a new method of reactive power dispatch under the excitation current limit adapted in CPF calculation was given out; Simulation used the improved algorithm were done. The simulation results of the IEEE 30 system show that the proposed model is effective and rational.

Keywords:

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通讯作者: 刘楠

作者简介:

作者Email: liunan@epri.sgcc.com.cn

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