

继电保护、通信及自动化

基于模型参数识别的母线保护原理

索南加乐, 邓旭阳, 宋国兵, 焦在滨

西安交通大学电气工程学院

摘要: 提出一种基于模型参数识别的母线保护新原理。将母线内部故障状态等效为一个电感电路模型, 发生故障时可实时计算出模型参数的等效瞬时阻抗值及参数的离散度, 并利用其在母线区内、外故障及电流互感器(current transformer, CT)不同饱和程度时的幅值特点, 构造出具有自适应制动特性的母线保护判据。当母线外部故障伴有CT饱和发生时, 该判据能可靠制动, 无需闭锁母线保护; 而当母线内部故障且CT饱和时, 保护能快速动作, 具有较高的动作可靠性和灵敏度。与传统的母线保护相比, 该保护无需滤波, 对各次谐波及非周期分量都适用, 动作速度更快。在3/2断路器接线的母线区内故障有汲出电流的情况下, 保护的灵敏度不受影响, 数字仿真和动模数据验证了其可靠性和有效性。

关键词: 参数识别 母线保护 电流互感器饱和 等效瞬时阻抗 离散度

Model-parameter Identification Based Bus-bar Protection Principle

SUONAN Jia-le, DENG Xu-yang, SONG Guo-bing, JIAO Zai-bin

School of Electrical Engineering, Xi'an Jiaotong University

Abstract: A novel model-parameter identification based bus-bar protection principle is proposed. An inductance model can be developed when the internal fault occurs on bus, and the inductance and the resistance of the model are taken as the unknown parameters. By calculating the equivalent instantaneous impedance and the dispersion of the parameters, and utilizing their difference, the external fault and the internal fault with different current transformer (CT) saturation degrees can be distinguished correctly. According to this, a new criterion with self-adaptive restraint characteristic for bus-bar protection is put forward. As the new principle is suitable for non-periodic component, fundamental component and harmonic component, it can operate more rapidly compared with the traditional bus-bar protection principles. Moreover, it can be applied to the bus-bar with one-and-a-half breaker arrangement and the protection performance won't be affected even when an internal fault occurs with current flowing out the bus. Simulation results show that the presented principle has high sensitivity and reliability.

Keywords: parameter identification bus-bar protection current transformer (CT) saturation equivalent instantaneous impedance dispersion

收稿日期 2009-05-30 修回日期 2009-07-30 网络版发布日期 2010-08-10

DOI:

基金项目:

国家自然科学基金项目(50677051, 50877061); 高等学校博士学科点专项科研基金项目(20070698057)。

通讯作者: 邓旭阳

作者简介:

作者Email: xjtu.dxy@stu.xjtu.edu.cn

参考文献:

本刊中的类似文章

1. 刘玉欢 陆于平 袁宇波 查申森 林霞.基于磁制动原理的特高压变压器励磁涌流快速识别[J]. 中国电机工程学报, 2007,27(34): 52-58
2. 李晓华 尹项根 陈德树.三相同时刻采样值电流差动保护[J]. 中国电机工程学报, 2007,27(31): 64-70

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(306KB)
- ▶ [HTML全文]
- ▶ 参考文献[PDF]
- ▶ 参考文献

服务与反馈

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 参数识别
- ▶ 母线保护
- ▶ 电流互感器饱和
- ▶ 等效瞬时阻抗
- ▶ 离散度

本文作者相关文章

- ▶ 索南加乐
- ▶ 邓旭阳
- ▶ 宋国兵
- ▶ 焦在滨

PubMed

- ▶ Article by Suo,N.J.L
- ▶ Article by Deng,X.Y
- ▶ Article by Song,G.B
- ▶ Article by Qiao,Z.B

3. 索南加乐 邵文权 宋国兵.基于参数识别的单相自适应重合闸研究[J]. 中国电机工程学报, 2009,29(1): 48-54
 4. 韩小涛 李伟 尹项根 陈德树.应用电子式电流互感器的变压器差动保护研究[J]. 中国电机工程学报, 2007,27(4): 47-53
 5. 邵文权 宋国兵 索南加乐 梁振锋.带并联电抗器输电线路三相自适应重合闸永久性故障判别[J]. 中国电机工程学报, 2010,30(4): 91-98
 6. 邵德军 尹项根 张哲 陈德树 金明亮.基于基波幅值增量的变压器和应涌流识别方法[J]. 中国电机工程学报, 2010,30(10): 77-83
 7. 杜姣 陆于平 朱国防.幅值相位双判据变压器差动保护算法[J]. 中国电机工程学报, 2010,30(16): 79-85
 8. 索南加乐 梁振锋 宋国兵.采用模量参数识别的三相重合闸永久性故障判别原理[J]. 中国电机工程学报, 2010,30(25): 81-86
-