

电力系统

谐波对电网中有功计量装置的影响

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摘要:

随着非线性负荷的广泛应用, 电网谐波污染日益严重。电力系统中使用的计量用互感器、有功电能表大多针对工频正弦波设计, 畸变波形对其计量准确度产生了不同程度的影响。基于有功计量装置的频率响应特性分析了电力谐波对不同计量装置的误差影响情况, 并提出了目前电网有功计量方式的问题和建议。

关键词: 电力系统谐波 频率响应特性 有功计量装置 计量误差 电能计量方式

Analysis on Affects of Harmonics on Active Energy Metering Devices

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Abstract:

Along with the wide application of nonlinear power electronic devices in power grids, harmonic pollution in power systems becomes more and more severe. Most instrument transformers and watt-hour meters installed in power systems are designed to measure power frequency signals with sinusoidal waveform, the measurement accuracy of these measuring devices will be affected by distorted waveform to a certain extent. Based on the frequency response characteristics of active power measuring devices, the affects of harmonics on measurement error of different kinds of measuring devices are analyzed, and the defects of existing active power measurement mode are pointed out and related suggestions are given.

Keywords: harmonics frequency response characteristic active energy measurement devices measurement error measuring manner of electric energy

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参考文献:

- [1] 李战鹰, 李建华. ± 800 kV特高压直流输电系统特征谐波分析[J]. 电网技术, 2006, 30(24): 10-13, 34. Li Zhanying, Li Jianhua. Analysis of characteristic harmonics in ± 800 kV ultra high voltage direct current power transmission system[J]. Power System Technology, 2006, 30(24): 10-13, 34(in Chinese).
- [2] 李季, 罗隆福. 直流输电谐波不稳定抑制新方法[J]. 电力自动化设备, 2008, 28(2): 6-9. Li Ji, Luo Longfu. Suppression of harmonic instability in HVDC [J]. Electric Power Automation Equipment, 2008, 28(2): 6-9(in Chinese).
- [3] 李建华, 王渊. 高压直流输电系统谐波计算软件包开发与应用[J]. 电力系统自动化, 2009, 33(4): 96-99. Li Jianhua, Wang Yuan. Development and application of harmonic calculation software for HVDC system[J]. Automation of Electric Power Systems, 2009, 33(4): 96-99 (in Chinese).
- [4] 张诚, 廖勇, 孙才新. 三峡交直流混合输电系统谐波的仿真分析和计算[J]. 电力系统自动化, 2003, 27(24): 47-49. Zhang Cheng, Liao Yong, Sun Caixin. Simulation and calculation of harmonic for Three Gorges AC and DC transmission system [J]. Automation of Electric Power Systems, 2003, 27(24): 47-49(in Chinese).
- [5] 赵贺, 林海雪. 电网中非线性负荷谐波功率方向

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的确定[J]. 电网技术, 2007, 31(17): 51-54. Zhao He, Lin Haixue. Determining harmonic power flow direction of nonlinear load in power network[J]. Power System Technology, 2007, 31(17): 51-54(in Chinese). [6] 吴竞昌. 供电系统谐波[M]. 北京: 水利电力出版社, 1998. [7] Watson N R. 电力系统谐波[M]. 林海雪, 等译. 2版. 北京: 中国电力出版社, 1988. [8] 任晓东, 陈树勇. 电子式电流互感器高压侧取能装置的设计[J]. 电网技术, 2008, 32(18): 67-71. Ren Xiaodong, Chen Shuyong. Design of a high side energy extracting device for active electronic current transformer[J]. Power System Technology, 2008, 32(18): 67-71(in Chinese). [9] 张蓬鹤, 邓泽官. 计量用互感器在线监测系统的研制[J]. 电测与仪表, 2009, 46(7): 41-44. Zhang Penghe, Deng Zeguan. The development of the metric transformer online monitoring system[J]. Electrical Measurement & Instrumentation, 2009, 46(7): 41-44(in Chinese). [10] 葛毅. 电力谐波对电能表电能计量的影响研究[D]. 重庆: 重庆大学, 2003. [11] Baghzouz Y, Owen T T. Harmonic analysis of induction watt-hour meter[J]. IEEE Trans on Power Apparatus and System, 1985, PAS-104(2): 99-106. [12] 申邵东, 魏星. 谐波对有功电能计量影响的仿真研究[J]. 电力自动化设备, 2008, 28(2): 54-56. Shen Shaodong, Wei Xing. Influence of harmonics on electric energy measurement[J]. Electric Power Automation Equipment, 2008, 28(2): 54-56(in Chinese). [13] 何群. 电力谐波对电能计量影响的研究[J]. 四川电力技术, 2009(1): 50-54. He Qun. Research on influence of harmonics on electric energy measurement[J]. Sichuan Electric Power Technology, 2009(1): 50-54(in Chinese). [14] 梅永, 王柏林. 电力系统信号采集与谐波测量方法[J]. 电测与仪表, 2008, 45(9): 5-10. Mei Yong, Wang Bolin. Signal acquisition and measurement methods for harmonics in power systems[J]. Electrical Measurement & Instrumentation, 2008, 45(9): 5-10(in Chinese). [15] 孙益辉, 符杨. 基于嵌入式Linux和QT/Embedded的电力谐波信号采集[J]. 电测与仪表, 2008, 45(11): 18-21. Sun Yihui, Fu Yang. Sampling power harmonics signals based on embedded Linux and QT/Embedded[J]. Electrical Measurement & Instrumentation, 2008, 45(11): 18-21(in Chinese).

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