

对观音阁变电站故障录波器的摘录探讨

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故障录波装置是保证电力系统安全运行的重要自动装置,在电力系统故障或振荡时,能够快速、可靠记录故障电气量,所录电气量或数据,对系统安全运行有十分重要作用。当系统振荡时,产生的振荡电流或电压幅值,致使录波器不必要的动作,振荡波形无济于事,动作次数也“不计其数”,不必要的动作录波,录波装置亦成了千疮之物,增大了工作人员的维护工作量,严重浪费了录波胶卷,更重要的是可靠录波严重降低,造成严重的后顾之忧。

故障录波装置如图 1 所示:

系统正常运行时,出现正序分量,测量回路无输出电压,故录波器不动作。

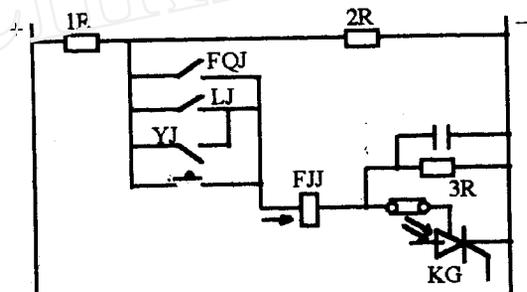
当系统发生故障,负序电压的产生,经测量回路起动,FQJ 触点闭合,将可控硅 KG 触发导通,经逻辑后录波,当发生接地故障,不仅有负序电流,且有零序电流,经测量回路,触点 FQJ 闭合,KG 导通,逻辑后录波,当电力系统振荡时,FQJ 不动作,靠电流继电器和电压继电器在一个振荡周期内不断动作,来达到触点闭合进行录波。

为保证录波器动作的有价值性,能够快速、可靠启动,对于系统的振荡进行录波,纯属多余,对系统发生的不对称短路、对称短路等故障而引起的开关跳闸,均能进行按部就班的故障录波,而对于系统振荡没有引起开关跳闸而进行的故障录波,应将之删掉,为加强故障录波的可靠摘录,必须进行录波器直流回路的改接线。

当系统正常运行时,录波装置测量回路无负序分量和零序分量,KG 不导通,故录波器不动作。

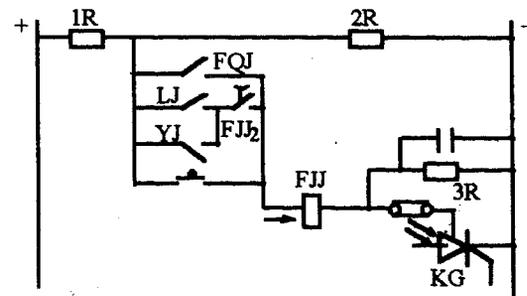
当系统发生不对称短路,产生的负序电压和零序电流,FQJ 触点闭合,经 FJJ 继电器接通 KG 控制回路,KG 触发导通后录波,故障消失后,恢复正常状态。

当系统发生对称短路及断线时的不接地故障瞬间出现的负序、零序分量,FQJ 迅速动作,触点闭合,KG 触发导通,经逻辑后录波,励磁的 FJJ 早已动作,FJJ₂ 触点闭合,瞬间,起动元件 YJ 和 LJ 早已处于动作状态,即使 FQJ 短时动作后复归,但已闭合的 FJJ₂ 为瞬时闭合、延时打开的常开触点,(保证了 FJJ₂ 的动作可靠性),经 YJ、LJ 触点闭合,所形成的自保(下转 70 页)



FQJ→复合启动继电器 LJ→电流继电器
YJ→电压继电器 FJJ→极化继电器

图 1



FJJ₂→极化继电器 FJJ 的带瞬时
闭合、延时打开常开触点

图 2

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表 3.

编号	检定点	上级检定结果(Ω)	本系统检定结果(Ω)	比对结果差值(Ω)	相当于℃
002	0℃	99.973	99.994	0.021	0.053
	100℃	138.453	138.486	0.033	0.087
003	0℃	100.020	99.993	0.027	0.069
	100℃	138.548	138.509	0.039	0.103

4 二次仪表的检定

按要求将被检二次仪表与本系统连线接好。运行系统主控程序,进入二次仪表的检定,在主菜单下,选择所需被检定的二次仪表,输入有关参数(送检单位、型号、分度号、测量范围、精度等级、制造厂、仪表编号、检测点的温度值等),按键盘任意键系统将自动与各外部设备进行联接,按照规程的要求进行上、下行程的测量。系统测量完毕后,自动计算基本误差、回程误差、示值重复性、平均值等。检定完后打印出符合规程要求的原始记录。亦可将本次检定数据存储在外部存储器中,以备查验。

综上所述分析和实际应用表明:该系统是一套功能全、操作简便、工作可靠、高精度自动控制、测试、节能、先进的智能化热工仪表计量标准装置。我们使用该装置后,彻底摆脱了繁琐、费时的人工操作和计算,大大降低了计量检定人员的劳动强度,同时节约了检定费用,提高了经济效益,确保了我公司科研和生产温度参数的准确可靠,为提高本公司的产品质量发挥了重要作用。

(上接 64 页)持回路,使 KG 触发导通,经逻辑后录波,故障消失后,YJ、LJ 触点打开,FJJ₂ 经延时打开,录波装置复归。(FJJ₂ 对该回路起了闭锁作用)。

电力系统发生振荡时,FQJ 不动作,虽 YJ、LJ 在一个振荡周期内不断动作和复归,触点闭合,但 FJJ₂ 触点未能闭合,经 FJJ 继电器的触点闭锁,录波装置免录,节约了故障录波胶卷。

当 PT 二次回路断线时,YJ 继电器动作,触点闭合,但经改接线后的 FJJ₂ 触点闭锁,录波装置不动作,通过中央预告信号进行处理,同时也避免了录波的不必要性。

光线式录波装置直流回路,经上述改接线后可减轻工作人员的维护工作量,减少了不必要的胶卷浪费,使不必要的故障录波得到改善,达到录波器摘录目的,从而进一步提高了电力系统的安全运行。

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本刊自一九九七年由季刊改为双月刊

This paper simply describes the mathematic model for computer setting calculation of bus differential protection, consideration of operation mode, protection setting principle, and setting calculation program of the bus differential protection written basing on the above method. The program has been applied in a real electric network and can meet the requirement of engineering calculation.

Key words, bus differential protection, computer calculation

Research The Algorithm of Extracting The Square Root in Electric Transducer Zhou Damin(30)

It will take a lot of time to extract the square root in the microprocessor-based electric transducer realized on electrotechnical laws. This paper firstly analyzes the shortcomings of the two algorithms of extracting square root, Newton iteration and fast table look-up, and improve them to yield two adaptive combined algorithms of extracting the square root. Thus the speed of extracting the square root increases greatly.

Key words, electric transducer, algorithm of extracting the square root

NEW PRODUCT DEVELOPMENT

General-Used High Accuracy Optic-Fibre Sensing System Zhang Peiming, et al(35)

This paper introduces a general-used high accuracy optic-fibre sensing system which is suitable for on-line measuring current.

Key words, general-used, optic-fibre sensing system, on-line detection

Developmet of Electromagnetic Relay CAD Expert System Xiu Shixin, et al(39)

The architecture, function, building method and feature of the electromagnetic relay CAD expert system are described. The system is equipped with an experience knowledge base of relay expert, which can form judgement and inference upon the expert experience knowledge and simulate the design thinking and solving way of the experts. Application of the expert system technique in CAD solves the non-numerical questions in conventional CAD system and has important significance in realizing intellectualization and automation of electric product.

Key words, electromagnetic relay, CAD, expert system

Application of Integration Development Technology in Upgrade of relaying panel CAD system Xu Tao, et al(43)

Research on KGD3 Control Power Supply of Electromagnetic Brake Xie Shuangquan, et al(48)

SERVICE EXPERIENCE

Discussion on Preventing DC Parasitic Circuit And One-Point-Earthing Zou Shenyuan(52)

Some accident examples of parasitic circuits occurring in relay device are listed. The improving method is presented by analyzing these examples and how to use the special-used terminals in The Keyoints of Anti-accident Measure in Relay and Safety Automation Device' is described. This paper also analyzes the relationship between the capacitance of dc postive and negative poles to earth and the voltage of both coil ends and the measures to be taken when the positive terminal of output auxiliary relay coil earthes.

Key words, parasitic circuit, one-point-earthing

Discussion on The Relay Protection And Secondary Circuit in Main Electric Connections of $1 \frac{1}{2}$ Circuit Breaker Used for 220kV Substation Zhang Huaqing(58)

Discussion on Selectable Recording of Fault Recorder in Guangyinge Substation Wang Bing(64)

Application Problem of Economizer Signal Lamp in Control Signal Circuit and Its Solution Chen Yuanpeng(65)

Application of ZRJ-03 Intelligent Thermotechnic Meter Calibration System Wang Dean(67)

STRUCTURE AND TECHNOLOGY

Discussion on Several Questions of CAPP Xia Chuenhou, et al(71)

Significance of Application and Dissemination of SMT Yin Xuebo, et al(74)

This paper explains the significance of application and dissemination of SMT and analyzes the process of SMT and THT. It also describes the feasibility of SMT.

Key words, SMT, SMD, SMC, SMB

Technology and Quality Control During The Trial-Production of Relay Protection Product Prototype Wang Jie(77)

Technology and quality control is closely related with the quality of prototype trial-prduction of relay protection product. In view of the speciality of prototype trial-production and the site management of trial-production, the action of technology and quality control during the trial-production of relay prototype is described.

Key words, prototype trial-production, technology, quality