

[Book] Fault Detection And Protection Of Three Phase Induction Motor

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Advanced Power System Protection and Incipient Fault Detection and Protection of Spaceborne Power Systems - National Aeronautics and Space Administration (NASA) - 2018-07-17

This research concentrated on the application of advanced signal processing, expert system, and digital technologies for the detection and control of low grade, incipient faults on spaceborne power systems. The researchers have considerable experience in the application of advanced digital technologies and the protection of terrestrial power systems. This experience was used in the current contracts to develop new approaches for protecting the electrical distribution system in spaceborne applications. The project was divided into three distinct areas: (1) investigate the applicability of fault detection algorithms developed for terrestrial power systems to the detection of faults in spaceborne systems; (2) investigate the digital hardware and architectures required to monitor and control spaceborne power systems with full capability to implement new detection and diagnostic algorithms; and (3) develop a real-time expert operating system for implementing diagnostic and protection algorithms. Significant progress has been made in each of the above areas. Several terrestrial fault detection algorithms were modified to better adapt to spaceborne power system environments. Several digital architectures were developed and evaluated in light of the fault detection algorithms. Russell, B. Don Unspecified Center DEFECTS; DETECTION; EXPERT SYSTEMS; FAULT DETECTION; MONITORS; OPERATING SYSTEMS (COMPUTERS); SIGNAL PROCESSING; SPACECRAFT POWER SUPPLIES; ALGORITHMS; ARCHITECTURE (COMPUTERS); REAL TIME OPERATION

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Fault Detection, Protection and Location on Transmission Line. A Review - Seada Hussen Adem - 2020-10-07

Research Paper (postgraduate) from the year 2020 in the subject Electrotechnology, grade: 1, Addis Ababa University (Addis Ababa Science and Technology University Addis Ababa, Ethiopia + Istanbul Sabahattin Zaim University Istanbul, Turkey), language: English, abstract: Electrical power transmission systems suffer from unexpected failures due to various random causes. Un-predicted faults that occur in power systems are required to prevent from propagation to other area in the protective system. The functions of the protective systems are to detect, then classify and finally determine the location of the faulty. This paper presents some techniques that helps to find, determine and diagnosing faults in transmission line. Artificial neural networks, impedance measurement based methods, fuzzy expert method, wavelet transform and so on have been used to achieve fault identification and classification.This paper will review the type of fault that possibly occurs in an electric power system, the type of fault detection and location technique that are available together with the protection device that can be utilized in the power system to protect the equipment from electric fault.

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High Impedance Fault Detection and Overvoltage Protection in Low Voltage Power Systems - 2017-01-27

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Ann Based Fault Detection, Classification and Distance Location - Anamika Jain - 2011-11

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DC Arc Fault Detection and Protection in DC Based Electrical Power Systems - Xiu Yao - 2015

hybrid electric vehicle, photovoltaic power plant, residential microgrid, etc. A very challenging problem in dc systems is arc faults. They can be caused by loose connections or degraded insulation, where very small air gaps are created. The voltage difference across the small gap will initiate a plasma arcing channel with extremely high temperature. If not detected and extinguished in time, arc faults could endanger adjacent circuits and eventually cause fire hazards. Although it is very crucial to minimize the impact of dc arc faults through timely detection and extinguishing, the research topic of dc arc fault detection and system level protection has not been studied very closely before. It is quite recent that dc systems are being used extensively for power distribution. Moreover, modern energy sources and power electronics based loads in aforementioned applications also make this research topic more challenging. This work proposes a novel detection scheme to improve the detection accuracy and to reduce unwanted false tripping. It has been achieved by investigating physical characteristics of the dc arc and analyzing the arc current signals. The voltage-current characteristics of the dc arc as well as the high frequency arc noise is modeled and analyzed. This model enables an accurate simulation study of the dc arc. A new detection scheme based on two arc signatures from both time domain and time-frequency domain is proposed and verified through experiments. This strategy increases the detection accuracy and reduces the possibility of false trip. Moreover, the impact of dc arc to a larger system, e.g. a dc microgrid with multiple voltage sources and multiple resistive loads, is studied. The interactions between dc arc faults and two typical microgrid control strategies are also analyzed. The final portion of this research is focused on system level detection and protection. A comprehensive dc arc fault detection and protection scheme which can be integrated with the existing protection system of a dc microgrid is proposed in order to improve protection efficiency and minimize additional hardware/software installations.

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Fault Diagnosis and Detection - Mustafa Demetgul - 2017-05-31

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Fault Detection, Identification and Protection Method for Single Stage and Interleaved Boost Converters - Elham Pazouki - 2018

This dissertation addresses a fast fault detection and recovery of DC-DC converters to ensure continuous converter operation. The first contribution of this dissertation is a predictive current emulator model developed based on sensor data. The main idea is to apply the derivative of the inductor current, based on the modulation of the particular DC-DC converter, to provide a predictive current emulator model. The emulator will provide the predicted value of the current as a function of certain control signals that are sampled and held during each switching cycle. The developed current emulator, intended for fault diagnosis in DC-DC converters, can be implemented within the range of the power converters. The second contribution is a low cost, fast responding, easy to implement switch fault diagnosis technique capable of identifying and locating the faulty component. The diagnosis module will be composed of a detection unit and an identification unit. In the detection unit, the measured inductor current and its corresponding predicted current will be used to diagnose the switch fault. The identification unit will receive the measured and predicted current, along with the gate pulse signal, to define the faulty switch and switch fault type. The developed algorithm will be implemented on two different switching power converters, a boost converter and an interleaved boost converter. The third contribution is a fault tolerant control method to ensure that the DC-DC converter remains operational after the fault occurs. This will be achieved through the control system, which will isolate the defective component from the rest of the converter while keeping the output voltage unchanged and current sharing equal among the remaining healthy modules.

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Investigation of Methodologies for Fault Detection and Diagnosis in Electric Power System Protection - Adeyemi Charles Adewole - 2012

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An Investigation Into a Method of Fault Detection on Long Transmission Lines Using Multiple Protection Schemes - Xun Yang - 1993

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Computer Relaying for Power Systems - Arun G. Phadke - 2009-07-20

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Fault-Diagnosis Systems - Rolf Isermann - 2006-01-16

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Fault-Diagnosis Applications - Rolf Isermann - 2011-04-06
Supervision, condition-monitoring, fault detection, fault diagnosis and fault management play an increasing role for technical processes and vehicles in order to improve reliability, availability, maintenance and lifetime. For safety-related processes fault-tolerant systems with redundancy are required in order to reach comprehensive system integrity. This book is a sequel of the book "Fault-Diagnosis Systems" published in 2006, where the basic methods were described. After a short introduction into fault-detection and fault-diagnosis methods the book shows how these methods can be applied for a selection of 20 real technical components and processes as examples, such as: Electrical drives (DC, AC) Electrical actuators Fluidic actuators (hydraulic, pneumatic) Centrifugal and reciprocating pumps Pipelines (leak detection) Industrial robots Machine tools (main and feed drive, drilling, milling, grinding) Heat exchangers Also realized fault-tolerant systems for electrical drives, actuators and sensors are presented. The book describes why and how the various signal-model-based and process-model-based methods were applied and which experimental results could be achieved. In several cases a combination of different methods was most successful. The book is dedicated to graduate students of electrical, mechanical, chemical engineering and computer science and for engineers.

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Design, Control, and Application of Modular Multilevel Converters for HVDC Transmission Systems - Kamran Sharifabadi - 2016-10-17
Design, Control and Application of Modular Multilevel Converters for HVDC Transmission Systems is a comprehensive guide to semiconductor technologies applicable for MMC design, component sizing control, modulation, and application of the MMC technology for HVDC transmission. Separated into three distinct parts, the first offers an overview of MMC technology, including information on converter component sizing, Control and Communication, Protection and Fault Management, and Generic Modelling and Simulation. The second covers the applications of MMC in offshore WPP, including planning, technical and economic requirements and optimization options, fault management, dynamic and transient stability. Finally, the third chapter explores the applications of MMC in HVDC transmission and Multi Terminal configurations, including Supergrids. Key features: Unique coverage of the offshore application and optimization of MMC-HVDC schemes for the export of offshore wind energy to the mainland. Comprehensive explanation of MMC application in HVDC and MTDC transmission technology. Detailed description of MMC components, control and modulation, different modeling approaches, converter dynamics under steady-state and fault contingencies including application and housing of MMC in HVDC schemes for onshore and offshore. Analysis of DC fault detection and protection technologies, system studies required for the integration of HVDC terminals to offshore wind power plants, and commissioning procedures for onshore and offshore HVDC terminals. A set of self-explanatory simulation models for HVDC test cases is available to download from the companion website. This book provides essential reading for graduate students and researchers, as well as field engineers and professionals who require an in-depth understanding of

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Advanced Control of Electrical Drives and Power Electronic Converters - Jacek Kabziński - 2016-09-30

This contributed volume is written by key specialists working in multidisciplinary fields in electrical engineering, linking control theory, power electronics, artificial neural networks, embedded controllers and signal processing. The authors of each chapter report the state of the art of the various topics addressed and present results of their own research, laboratory experiments and successful applications. The presented solutions concentrate on three main areas of interest: · motion control in complex electromechanical systems, including sensorless control; · fault diagnosis and fault tolerant control of electric drives; · new control algorithms for power electronics converters. The chapters and the complete book possess strong monograph attributes. Important practical and theoretical problems are deeply and accurately presented on the background of an exhaustive state-of the art review. Many results are completely new and were never published before. Well-known control methods like field oriented control (FOC) or direct torque control (DTC) are referred as a starting point for modifications or are used for comparison. Among numerous control theories used to solve particular problems are: nonlinear control, robust control, adaptive control, Lyapunov techniques, observer design, model predictive control, neural control, sliding mode control, signal filtration and processing, fault diagnosis, and fault tolerant control.

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Fault Detection, Diagnosis and Prognosis - Fausto Pedro García Márquez - 2020-02-05

This book presents the main concepts, state of the art, advances, and case studies of fault detection, diagnosis,

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Fault Detection, Supervision and Safety for Technical Processes 1991 - B. Freyermuth - 2014-05-23

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Advanced Condition Monitoring and Fault Diagnosis of Electric Machines - Irfan, Muhammad - 2018-09-14

The reliability of induction motors is a major requirement in many industrial applications. It is especially important where an unexpected breakdown might result in the interruption of critical services such as military operations, transportation, aviation, and medical applications. Advanced Condition Monitoring and Fault Diagnosis of Electric Machines is a collection of innovative research on various issues related to machinery condition monitoring, signal processing and conditioning, instrumentation and measurements, and new trends in condition monitoring. It also pays special attention to the fault identification process. While highlighting topics

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Recent Trends In Applied Systems Research 1995 - - 1995

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Synchronized Phasor Measurements and Their Applications - A.G. Phadke - 2008-08-15

This book provides an account of the field of synchronized Phasor Measurement technology, its beginning, its technology and its principal applications. It covers wide Area Measurements (WAM) and their applications. The measurements are done using GPS systems and eventually will replace the existing technology. The authors created the field about twenty years ago and most of the installations planned or now in existence around the world are based on their work.

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