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KEY=AUTOMATION - LOGAN SHYANNE

Power System Protection in Smart Grid Environment

CRC Press With distributed generation interconnection power flow becoming bidirectional, culminating in network problems, smart grids aid in electricity generation, transmission, substations, distribution and consumption to achieve a system that is clean, safe (protected), secure, reliable, efficient, and sustainable. This book illustrates fault analysis, fuses, circuit breakers, instrument transformers, relay technology, transmission lines protection setting using DIGsILENT Power Factory. Intended audience is senior undergraduate and graduate students, and researchers in power systems, transmission and distribution, protection system broadly under electrical engineering.

Network Protection & Automation Guide

Industrial Network Security

Securing Critical Infrastructure Networks for Smart Grid, SCADA, and Other Industrial Control Systems

Syngress As the sophistication of cyber-attacks increases, understanding how to defend critical infrastructure systems—energy production, water, gas, and other vital systems—becomes more important, and heavily mandated. **Industrial Network Security, Second Edition** arms you with the knowledge you need to understand the vulnerabilities of these distributed supervisory and control systems. The book examines the unique protocols and applications that are the foundation of industrial control systems, and provides clear guidelines for their protection. This how-to guide gives you thorough understanding of the unique challenges facing critical infrastructures, new guidelines and security measures for critical infrastructure protection, knowledge of new and evolving security tools, and pointers on SCADA protocols and security implementation. All-new real-world examples of attacks against control systems, and more diagrams of systems Expanded coverage of protocols such as 61850, Ethernet/IP, CIP, ISA-99, and the evolution to IEC62443 Expanded coverage of Smart Grid security New coverage of signature-based detection, exploit-based vs. vulnerability-based detection, and signature reverse engineering

Smart Grid

Fundamentals of Design and Analysis

John Wiley & Sons The book is written as primer hand book for addressing the fundamentals of smart grid. It provides the working definition the functions, the design criteria and the tools and techniques and technology needed for building smart grid. The book is needed to provide a working guideline in the design, analysis and development of Smart Grid. It incorporates all the essential factors of Smart Grid appropriate for enabling the performance and capability of the power system. There are no comparable books which provide information on the “how to” of the design and analysis. The book provides a fundamental discussion on the motivation for the smart grid development, the working definition and the tools for analysis and development of the Smart Grid. Standards and requirements needed for designing new devices, systems and products are discussed; the automation and computational techniques need to ensure that the Smart Grid guarantees adaptability, foresight alongside capability of handling new systems and components are discussed. The interoperability of different renewable energy sources are included to ensure that there will be minimum changes in the existing legacy system. Overall the book evaluates different options of computational intelligence, communication technology and decision support system to design various aspects of Smart Grid. Strategies for demonstration of Smart Grid schemes on selected problems are presented.

Electricity Supply Systems of the Future

Springer Nature This book offers a vision of the future of electricity supply systems and CIGRE’s views on the know-how that will be needed to manage the transition toward them. A variety of factors are driving a transition of electricity supply systems to new supply models, in particular the increasing use of renewable sources, environmental factors and developments in ICT technologies. These factors suggest that there are two possible models for power network development, and that those models are not necessarily exclusive: 1. An increasing importance of large networks for bulk transmission capable of interconnecting load regions and large centralized renewable generation resources, including offshore and of providing more interconnections between the various countries and energy markets. 2. An emergence of clusters of small, largely self-contained distribution networks, which include decentralized local generation, energy storage and active customer participation, intelligently managed so that they operate as active networks providing local active and reactive support. The electricity supply systems of the future will

likely include a combination of the above two models, since additional bulk connections and active distribution networks are needed in order to reach ambitious environmental, economic and security-reliability targets. This concise yet comprehensive reference resource on technological developments for future electrical systems has been written and reviewed by experts and the Chairs of the sixteen Study Committees that form the Technical Council of CIGRE.

The State of Open Data

Histories and Horizons

African Minds It's been ten years since open data first broke onto the global stage. Over the past decade, thousands of programmes and projects around the world have worked to open data and use it to address a myriad of social and economic challenges. Meanwhile, issues related to data rights and privacy have moved to the centre of public and political discourse. As the open data movement enters a new phase in its evolution, shifting to target real-world problems and embed open data thinking into other existing or emerging communities of practice, big questions still remain. How will open data initiatives respond to new concerns about privacy, inclusion, and artificial intelligence? And what can we learn from the last decade in order to deliver impact where it is most needed? **The State of Open Data** brings together over 60 authors from around the world to address these questions and to take stock of the real progress made to date across sectors and around the world, uncovering the issues that will shape the future of open data in the years to come.

World Energy Outlook 2015

The precipitous fall in oil prices, continued geopolitical instability and the ongoing global climate negotiations are witness to the dynamic nature of energy markets. In a time of so much uncertainty, understanding the implications of the shifting energy landscape for economic and environmental goals and for energy security is vital. **The World Energy Outlook 2015 (WEO-2015)** will present updated projections for the evolution of the global energy system to 2040, based on the latest data and market developments, as well as detailed insights on the prospects for fossil fuels, renewables, the power sector and energy efficiency and analysis on trends in CO2 emissions and fossil-fuel and

renewable energy subsidies.

Format and Content of the Safety Analysis Report for Nuclear Power Plants

Safety Guide

IAEA This Safety Guide is intended primarily for use with land based stationary thermal nuclear power plants but it may, in parts, have a wider applicability to other nuclear facilities. It provides recommendations and guidance on the possible format and content of a SAR in support of a request to the State regulatory body for authorization to construct and or operate a nuclear power plant. As such, it contains recommendations on meeting the requirements of Safety guide GS-R-1 "Legal and governmental infrastructure for nuclear, radioactive waste and transport safety" (2000, ISBN 9201008007)

The Technological and Economic Future of Nuclear Power

Springer This open access book discusses the eroding economics of nuclear power for electricity generation as well as technical, legal, and political acceptance issues. The use of nuclear power for electricity generation is still a heavily disputed issue. Aside from technical risks, safety issues, and the unsolved problem of nuclear waste disposal, the economic performance is currently a major barrier. In recent years, the costs have skyrocketed especially in the European countries and North America. At the same time, the costs of alternatives such as photovoltaics and wind power have significantly decreased. Contents History and Current Status of the World Nuclear Industry The Dramatic Decrease of the Economics of Nuclear Power Nuclear Policy in the EU The Legacy of Csernoby and Fukushima Nuclear Waste and Decommissioning of Nuclear Power Plants Alternatives: Heading Towards Sustainable Electricity Systems Target Groups Researchers and students in the fields of political, economic and technical sciences Energy (policy)

experts, nuclear energy experts and practitioners, economists, engineers, consultants, civil society organizations The Editors Prof. Dr. Reinhard Haas is University Professor of energy economics at the Institute of Energy Systems and Electric Drives at Technische Universität Wien, Austria. PD Dr. Lutz Mez is Associate Professor at the Department for Political and Social Sciences of Freie Universität Berlin, Germany. PD Dr. Amela Ajanovic is a senior researcher and lecturer at the Institute of Energy Systems and Electrical Drives at Technische Universität Wien, Austria.--

Smart Grid

Technology and Applications

John Wiley & Sons Electric power systems worldwide face radical transformation with the need to decarbonise electricity supply, replace ageing assets and harness new information and communication technologies (ICT). The Smart Grid uses advanced ICT to control next generation power systems reliably and efficiently. This authoritative guide demonstrates the importance of the Smart Grid and shows how ICT will extend beyond transmission voltages to distribution networks and customer-level operation through Smart Meters and Smart Homes. Smart Grid Technology and Applications: Clearly unravels the evolving Smart Grid concept with extensive illustrations and practical examples. Describes the spectrum of key enabling technologies required for the realisation of the Smart Grid with worked examples to illustrate the applications. Enables readers to engage with the immediate development of the power system and take part in the debate over the future Smart Grid. Introduces the constituent topics from first principles, assuming only a basic knowledge of mathematics, circuits and power systems. Brings together the expertise of a highly experienced and international author team from the UK, Sri Lanka, China and Japan. Electrical, electronics and computer engineering researchers, practitioners and consultants working in inter-disciplinary Smart Grid RD&D will significantly enhance their knowledge through this reference. The tutorial style will greatly benefit final year undergraduate and master's students as the curriculum increasing focuses on the breadth of technologies that contribute to Smart Grid realisation.

Applied Cyber Security and the Smart Grid

Implementing Security Controls into the Modern Power Infrastructure

Newnes Many people think of the Smart Grid as a power distribution group built on advanced smart metering—but that's just one aspect of a much larger and more complex system. The "Smart Grid" requires new technologies throughout energy generation, transmission and distribution, and even the homes and businesses being served by the grid. This also represents new information paths between these new systems and services, all of which represents risk, requiring a more thorough approach to where and how cyber security controls are implemented. This insight provides a detailed architecture of the entire Smart Grid, with recommended cyber security measures for everything from the supply chain to the consumer. Discover the potential of the Smart Grid Learn in depth about its systems See its vulnerabilities and how best to protect it

Electronics

A Systems Approach

Pearson Education Electronics play a central role in our everyday lives, being at the heart of much of today's essential technology - from mobile phones to computers, from cars to power stations. As such, all engineers, scientists and technologists need a basic understanding of this area, whilst many will require a far greater knowledge of the subject. The third edition of "Electronics: A Systems Approach" is an outstanding introduction to this fast-moving, important field. Fully updated, it covers the latest changes and developments in the world of electronics. It continues to use Neil Storey's well-respected systems approach, firstly explaining the overall concepts to build students' confidence and understanding, before looking at the more detailed analysis that follows. This allows the student to contextualise what

the system is designed to achieve, before tackling the intricacies of the individual components. The book also offers an integrated treatment of analogue and digital electronics highlighting and exploring the common ground between the two fields. Throughout the book learning is reinforced by chapter objectives, end of chapter summaries, worked examples and exercises. This third edition is a significant update to the previous material, and includes: New chapters on Operational Amplifiers, Power Electronics, Implementing Digital Systems, and Positive Feedback, Oscillators and Stability . A new appendix providing a useful source of Standard Op-amp Circuits New material on CMOS, BiFET and BiMOS Op-amps New treatment of Single-Chip Microcomputers A greatly increased number of worked examples within the text Additional Self-Assessment questions at the end of each chapter Dr. Neil Storey is a member of the School of Engineering at the University of Warwick, where he has many years of experience in teaching electronics to a wide-range of undergraduate, postgraduate and professional engineers. He is also the author of "Safety-Critical Computer Systems" and "Electrical and Electronic Systems" both published by Pearson Education.

Smart Electricity Distribution Networks

CRC Press Smart distribution networks are one of the key research topics of countries looking to modernise electric power networks. Smart Electricity Distributions Networks aims to provide a basic discussion of the smart distribution concept and new technologies related to it, including distributed energy resources (DERs), demand side integration, microgrids, CELL and virtual power plants. With writing from leading contributors in the field of smart distribution networks, this volume discusses different concepts within the field as well as the best methods to analyse smart distribution systems to provide a cohesive overview of issues relating to Smart Grid and related technologies. This book will be valuable to those with an interest in understanding the technologies and performance of smart distribution networks as well as engaging with the wider debate over the future Smart Grid.

Smart Grids

Infrastructure, Technology, and Solutions

CRC Press What exactly is smart grid? Why is it receiving so much attention? What are utilities, vendors, and regulators doing about it? Answering these questions and more, **Smart Grids: Infrastructure, Technology, and Solutions** gives readers a clearer understanding of the drivers and infrastructure of one of the most talked-about topics in the electric utility market—smart grid. This book brings together the knowledge and views of a vast array of experts and leaders in their respective fields. **Key Features** Describes the impetus for change in the electric utility industry Discusses the business drivers, benefits, and market outlook of the smart grid initiative Examines the technical framework of enabling technologies and smart solutions Identifies the role of technology developments and coordinated standards in smart grid, including various initiatives and organizations helping to drive the smart grid effort Presents both current technologies and forward-looking ideas on new technologies Discusses barriers and critical factors for a successful smart grid from a utility, regulatory, and consumer perspective Summarizes recent smart grid initiatives around the world Discusses the outlook of the drivers and technologies for the next-generation smart grid Smart grid is defined not in terms of what it is, but what it achieves and the benefits it brings to the utility, consumer, society, and environment. Exploring the current situation and future challenges, the book provides a global perspective on how the smart grid integrates twenty-first-century technology with the twentieth-century power grid. **CRC Press Authors Speak** Stuart Borlase speaks about his book. Watch the video

Nuclear Energy

An Introduction to the Concepts, Systems, and Applications of Nuclear Processes

Elsevier This expanded, revised, and updated fourth edition of **Nuclear Energy** maintains the tradition of providing clear and comprehensive coverage of all aspects of the subject, with emphasis on the explanation of trends and developments. As in earlier editions, the book is divided into three parts that achieve a natural flow of ideas: **Basic**

Concepts, including the fundamentals of energy, particle interactions, fission, and fusion; Nuclear Systems, including accelerators, isotope separators, detectors, and nuclear reactors; and Nuclear Energy and Man, covering the many applications of radionuclides, radiation, and reactors, along with a discussion of wastes and weapons. A minimum of mathematical background is required, but there is ample opportunity to learn characteristic numbers through the illustrative calculations and the exercises. An updated Solution Manual is available to the instructor. A new feature to aid the student is a set of some 50 Computer Exercises, using a diskette of personal computer programs in BASIC and spreadsheet, supplied by the author at a nominal cost. The book is of principal value as an introduction to nuclear science and technology for early college students, but can be of benefit to science teachers and lecturers, nuclear utility trainees and engineers in other fields.

Sixtieth Annual Report

Hassell Street Press This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Offshore Renewable Energy: Ocean Waves, Tides and Offshore Wind

MDPI This book is a printed edition of the Special Issue "Offshore Renewable Energy: Ocean Waves, Tides and Offshore Wind" that was published in Energies

Smart Grids – Fundamentals and Technologies in Electricity Networks

Springer Efficient transmission and distribution of electricity is a fundamental requirement for sustainable development and prosperity. The world is facing great challenges regarding the reliable grid integration of renewable energy sources in the 21st century. The electric power systems of the future require fundamental innovations and enhancements to meet these challenges. The European Union’s “Smart Grid” vision provides a first overview of the appropriate deep-paradigm changes in the transmission, distribution and supply of electricity. The book brings together common themes beginning with Smart Grids and the characteristics of new power plants based on renewable energy and /or highly efficient generation principles. It covers the advanced technologies applied today in the transmission and distribution networks and innovative solutions for maintaining today’s high power quality under the challenging conditions of large-scale shares of volatile renewable energy sources in the annual energy balance. Besides considering the new primary and secondary technology solutions and control facilities for the transmission and distribution networks, prospective market conditions allowing network operators and the network users to gain benefits are also discussed. The growing role of information and communication technologies is investigated. The importance of new standards is underlined and the current international efforts in developing a consistent set of standards are described in detail. The presentation of international experiences to apply novel Smart Grid solutions to the practice of network operation concludes this book. The authors of the book worked for many years to develop Smart Grid solutions within national and international projects and to introduce them in the practice of network operations.

Operation of Electrical Installations

World Energy Outlook 2017

The global energy scene is in a state of flux. Large-scale shifts include: the rapid deployment and steep declines in the costs of major renewable energy technologies; the growing importance of electricity in energy use across the globe; profound changes in China's economy and energy policy, moving consumption away from coal; and the continued surge in shale gas and tight oil production in the United States. These changes provide the backdrop for the World Energy Outlook-2017, which includes a full update of energy demand and supply projections to 2040 based on different scenarios. The projections are accompanied by detailed analyses of their impact on energy industries and investment, as well as implications for energy security and the environment. The report this year includes a focus on China, which examines how China's choices could reshape the global outlook for all fuels and technologies. A second focus, on natural gas, explores how the rise of shale gas and LNG are changing the global gas market as well as the opportunities and risks for gas in the transition to a cleaner energy system. Finally, the WEO-2017 introduces a major new scenario -the Sustainable Development Scenario -that outlines an integrated approach to achieving internationally agreed objectives on climate change, air quality and universal access to modern energy.

Project Management in Nuclear Power Plant Construction Guidelines and Experience

This publication provides guidance on project management from the preparatory phase to plant turnover to commissioning of nuclear power plants. The guidelines and experiences described will enable project managers to obtain better performance in nuclear power plant construction.

Internationalization of the Nuclear Fuel Cycle

Goals, Strategies, and Challenges

National Academies Press The so-called nuclear renaissance has increased worldwide interest in nuclear power. This potential growth also has increased, in some quarters, concern that nonproliferation considerations are not being given sufficient attention. In particular, since introduction of many new power reactors will lead to requiring increased uranium enrichment services to provide the reactor fuel, the proliferation risk of adding enrichment facilities in countries that do not have them now led to proposals to provide the needed fuel without requiring indigenous enrichment facilities. Similar concerns exist for reprocessing facilities. Internationalization of the Nuclear Fuel Cycle summarizes key issues and analyses of the topic, offers some criteria for evaluating options, and makes findings and recommendations to help the United States, the Russian Federation, and the international community reduce proliferation and other risks, as nuclear power is used more widely. This book is intended for all those who are concerned about the need for assuring fuel for new reactors and at the same time limiting the spread of nuclear weapons. This audience includes the United States and Russia, other nations that currently supply nuclear material and technology, many other countries contemplating starting or growing nuclear power programs, and the international organizations that support the safe, secure functioning of the international nuclear fuel cycle, most prominently the International Atomic Energy Agency.

Advances and Innovations in Nuclear Decommissioning

Woodhead Publishing **Advances and Innovations in Nuclear Decommissioning** is an essential resource for industry professionals and academics interested in acquiring the most up-to-date information on the current state of nuclear decommissioning. Written and edited by the world's leading experts, this book considers lessons learned and new innovations in the field. Edited by Dr. Laraia, it is the perfect companion to his 2012 book, *Nuclear Decommissioning*, which critically reviews the nuclear decommissioning processes and technologies applicable to nuclear power plants and other civilian nuclear facilities. Where the earlier book covers the basics of decommissioning, this new book brings you up-to-date with new areas of interest and approaches, innovative technologies, and lessons learned by both the nuclear and non-nuclear decommissioning sectors. Focuses on new aspects, trends and innovative technologies Includes content on decommissioning after a severe accident, including the use of robotics Brings together information

from around the world and considers the lessons learned from the non-nuclear sector as well

OPC Unified Architecture

Springer Science & Business Media Motivation for This Book The OPC Foundation provides specifications for data exchange in industrial automation. There is a long history of COM/DCOM-based specifications, most prominent OPC Data Access (DA), OPC Alarms and Events (A&E), and OPC Historical Data Access (HDA), which are widely accepted in the industry and implemented by almost every system targeting industrial automation. Now the OPC Foundation has released a new generation of OPC specifications called OPC Unified Architecture (OPC UA). With OPC UA, the OPC Foundation fulfills a technology shift from the retiring COM/DCOM technology to a service-oriented architecture providing data in a platform-independent manner via Web Services or its own optimized TCP-based protocol. OPC UA unifies the previous specifications into one single address space capable of dealing with current data, alarms and events and the history of current data as well as the event history. A remarkable enhancement of OPC UA is the Address Space Model by which vendors can expose a rich and extensible information model using object-oriented techniques. OPC UA scales well from intelligent devices, controllers, DCS, and SCADA systems up to MES and ERP systems. It also scales well in its ability to provide information; on the lower end, a model similar to Classic OPC can be used, providing only base information, while at the upper end, highly sophisticated models can be described, providing a large amount of metadata including complex type hierarchies.

21st Century Prometheus

Managing CBRN Safety and Security Affected by Cutting-Edge Technologies

Springer Nature This book describes the evolving CBRN risk landscape and highlights advances in the “core” CBRN technologies, including when combined with (improvised) explosive devices (CBRNe threats). It analyses how associated technologies create new safety and security risks, challenging certain assumptions that underlie current

control regimes. The book also shows how technologies can be enablers for more effective strategies to mitigate these risks. 21st-century safety and security risks emanating from chemical, biological, radiological and nuclear materials - whether resulting from natural events, accidents or malevolent use - are increasingly shaped by technologies that enable their development, production or use in ways that differ from the past. Artificial intelligence, the use of cyberspace, the revolution in the life sciences, new manufacturing methods, new platforms and equipment for agent delivery, hypersonic weapons systems, information tools utilised in hybrid warfare - these and other technologies are reshaping the global security environment and CBRN landscape. They are leading to a growing potential for highly targeted violence, and they can lead to greater instability and vulnerability worldwide. At the same time, technology offers solutions to manage CBRN risks. Examples are faster detection, more accurate characterisation of the nature and origin of CBRN agents, new forensic investigation methods, or new medical treatments for victims of CBRN incidents. New educational concepts help to foster a culture of responsibility in science and technology and strengthen governance. New training methods help develop practical skills to manage CBRN risks more effectively. The book concludes that there is a growing need for a holistic framework towards CBRN risk mitigation. Traditional arms control mechanisms such as global, regional or bilateral treaties and export controls are still needed, as they provide a necessary legal and institutional framework. But laws and technology denial alone will not suffice, and institutional mechanisms can at times be weak. Given the pace of technological progress and the diffusion of critical knowledge, tools and materials, policymakers must accept that CBRN risks cannot be eliminated altogether. Instead, society has to learn to manage these risks and develop resilience against them. This requires a “softer”, broadly based multi-stakeholder approach involving governments, industry, the research and development communities, educators, and civil society. Furthermore, educating policymakers that cutting-edge technologies may seriously affect global strategic stability could create incentives for developing a more creative and contemporary arms control strategy that fosters cooperation rather than incremental polarisation.

The Human Contribution

Unsafe Acts, Accidents and Heroic Recoveries

Ashgate Publishing, Ltd. The Human Contribution is vital reading for all professionals in high-consequence environments and for managers of any complex system. The book draws its illustrative material from a wide variety of hazardous domains, with the emphasis on healthcare reflecting the author's focus on patient safety over the last decade. All students of human factors - however seasoned - will also find it an invaluable and thought-provoking read.

Microgrids and Active Distribution Networks

IET Microgrids and Active Distribution Networks offer a potential solution for sustainable, energy-efficient power supply to cater for increasing load growth, supplying power to remote areas, generation of clean power and reduction in emission of greenhouse gases & particulates as per Kyoto protocol.

Submarine Power Cables

Design, Installation, Repair, Environmental Aspects

Springer Science & Business Media The demand for high-performance submarine power cables is increasing as more and more offshore wind parks are installed, and the national electric grids are interconnected. Submarine power cables are installed for the highest voltages and power to transport electric energy under the sea between islands, countries and even continents. The installation and operation of submarine power cables is much different from land cables. Still, in most textbooks on electrical power systems, information on submarine cables is scarce. This book is closing the gap. Different species of submarine power cables and their application are explained. Students and electric engineers learn on the electric and mechanic properties of submarine cables. Project developers and utility managers will gain useful information on the necessary marine activities such as pre-laying survey, cable lay vessels, guard boats etc., for the submarine cable installation and repair. Investors and decision makers will find an overview on environmental aspects of submarine power cables. A comprehensive reference list is given for those who want further reading.

Energy Technology Perspectives 2017

Catalysing Energy Technology Transformations

Organization for Economic Co-Operation & Development The global energy system is moving closer to a historic transformation. This year's edition of the International Energy Agency (IEA)'s comprehensive publication on energy technology focuses on the opportunities and challenges of scaling and accelerating the deployment of clean energy technologies. This includes looking at more ambitious scenarios than the IEA has produced before. Improvements in technology continue to modify the outlook for the energy sector, driving changes in business models, energy demand and supply patterns as well as regulatory approaches. Energy security, air quality, climate change and economic competitiveness are increasingly being factored in by decision makers. Energy Technology Perspectives 2017 (ETP 2017) details these trends as well as the technological advances that will shape energy security and environmental sustainability for decades to come. For the first time, ETP 2017 looks at how far clean energy technologies could move the energy sector towards higher climate change ambitions if technological innovations were pushed to their maximum practical limits. The analysis shows that, while policy support would be needed beyond anything seen to date, such a push could result in greenhouse gas emission levels that are consistent with the mid-point of the target temperature range of the global Paris Agreement on climate change. The analysis also indicates that regardless of the pathway chosen for the energy sector transformation, policy action is needed to ensure that multiple economic, security and other benefits to the accelerated deployment of clean energy technologies are realised through a systematic and co-ordinated approach. ETP 2017 also features the annual IEA Tracking Clean Energy Progress report, which shows that the current progress in clean energy technology development and deployment remains sub-optimal. It highlights that progress has been substantial where policies have provided clear signals on the value of technology innovation. But many technology areas still suffer from a lack of financial and policy support.

Innovation in Nuclear Energy Technology

OECD Innovation has been a driving force in the successful deployment of nuclear energy and remains essential today for its sustainable future. This report provides an overview of the state of the art in nuclear innovation systems, including their driving forces, main actors, institutional and legal frameworks, and infrastructure for knowledge and programme management. It also offers policy recommendations based on country reports and case studies supplied by participating member countries.

Microgrids Design and Implementation

Springer This book addresses the emerging trend of smart grids in power systems. It discusses the advent of smart grids and selected technical implications; further, by combining the perspectives of researchers from Europe and South America, the book captures the status quo of and approaches to smart grids in a wide range of countries. It describes the basic concepts, enabling readers to understand the theoretical aspects behind smart grid formation, while also examining current challenges and philosophical discussions. Like the industrial revolution and the birth of the Internet, smart grids are certain to change the way people use electricity. In this regard, a new term - the “prosumer” - is used to describe consumers who may sometimes also be energy producers. This is particularly appealing if we bear in mind that most of the distributed power generation in smart grids does not involve carbon emissions. At first glance, the option of generating their own power could move consumers to leave their current energy provider. Yet the authors argue that doing so is not a wise choice: utilities will play a central role in this new scenario and should not be ignored.

Technical Challenges in the Application and Licensing of Digital Instrumentation and Control Systems in Nuclear

Power Plants

"With the modernization of existing analogue instrumentation and control (I & C) systems in nuclear power plants through digital I & C technology, and the implementation of digital I & C systems in new plants, the industry is faced with significant challenges. These challenges appear in the form of difficulties in managing the necessarily incremental transition, highly integrated (and interdependent) architectures, the flexible configurability enabled by digital technology, and uncertainty and inconsistency in licensing digital I & C systems and equipment in the different Member States. This publication discusses 17 major issues that utilities, developers, suppliers and regulatory stakeholders need to consider, so that the industry can capture and benefit from shared experience, recent technological developments, and emerging best practices."--Publisher's description.

Strategic Latency Unleashed

The Role of Technology in a Revisionist Global Order and the Implications for Special Operations Forces

The world is being transformed physically and politically. Technology is the handmaiden of much of this change. But since the current sweep of global change is transforming the face of warfare, Special Operations Forces (SOF) must adapt to these circumstances. Fortunately, adaptation is in the SOF DNA. This book examines the changes affecting SOF and offers possible solutions to the complexities that are challenging many long-held assumptions. The chapters explore what has changed, what stays the same, and what it all means for U.S. SOF. The authors are a mix of leading experts in technology, business, policy, intelligence, and geopolitics, partnered with experienced special operators who either cowrote the chapters or reviewed them to ensure accuracy and relevance for SOF. Our goal is to provide insights into the changes around us and generate ideas about how SOF can adapt and succeed in the emerging operational environment.

Global Wage Report 2018/19

What Lies Behind Gender Pay Gaps

The 2018/19 edition analyses the gender pay gap. The report focuses on two main challenges: how to find the most useful means for measurement, and how to break down the gender pay gap in ways that best inform policy-makers and social partners of the factors that underlie it. The report also includes a review of key policy issues regarding wages and the reduction of gender pay gaps in different national circumstances.

Ageing Management for Nuclear Power Plants: International Generic Ageing Lessons Learned (Igall)

Safety Reports Series No. 82 (Rev. 1)

This Safety Report provides detailed information on ageing management programmes and time limited ageing analyses to manage existing and potential ageing effects and degradation mechanisms of structures, systems and components (SSCs) that are important to the safety of nuclear power plants. It has been written to assist operating organizations and regulatory bodies by specifying a technical basis and providing practical guidance on managing ageing of mechanical, electrical and instrumentation and control components, and civil structures. It also provides a common, internationally recognized basis on what constitutes an effective ageing management programme, a knowledge base on ageing management for design of new plants and design reviews, and a roadmap to available information on ageing management.

Preparing for Decommissioning During Operation and After Final Shutdown

Decommissioning of Pools in Nuclear Facilities

Pools or ponds are usually an integrated part of a more complex nuclear facility, but in some particular cases pools may be considered as a separate nuclear facility with a specific license. A number of nuclear installations utilize pools for the cooling of spent fuel, or the shielding of research reactor cores or irradiator sources. Over a service lifetime that can span decades, nuclear pools may become contaminated as a result of the deposition of radioactive substances. Relevant aspects of pool decommissioning covered in this publication include project planning and management, health and safety, and the management of resulting waste.

Uranium Paris

1988

The Future of the Electric Grid

An Interdisciplinary MIT Study

"For well over a century, electricity has made vital contributions to the growth of the U.S. economy and the quality of American life. The U.S. electric grid is a remarkable achievement, linking electric generation units reliably and efficiently to millions of residential, commercial, and industrial users of electricity through more than six million miles of lines and associated equipment that are designed and managed by more than 3,000 organizations, many of which

are in turn regulated by both federal and state agencies. While this remarkable system of systems will continue to serve us well, it will face serious challenges in the next two decades that will demand the intelligent use of new technologies and the adoption of more appropriate regulatory policies. This report aims to provide a comprehensive, objective portrait of the U.S. electric grid and the challenges and opportunities it is likely to face over the next two decades. It also highlights a number of areas in which policy changes, focused research and demonstration, and the collection and sharing of important data can facilitate meeting the challenges and seizing the opportunities that the grid will face. This study is the sixth in the MIT Energy Initiative's "Future of" series."

IEEE Guide for Protective Relay Applications to Transmission Lines

This newly developed guide compiles information on the application considerations of protective relays to ac transmission lines. The guide describes accepted transmission line protection schemes and the different electrical system parameters and situations that affect their application. Its purpose is to provide a reference for the selection of relay schemes and to assist less experienced protective relaying engineers in their application.