

Gis High Voltage Gas Insulated Switchgear Substations

This edited book is based on the research papers presented at the 4th International Conference on Intelligent, Interactive Systems and Applications (ISA2019), held on June 28-30, 2019 in Bangkok, Thailand. Interactive intelligent systems (IIS) are systems that interact with human beings, media or virtual agents in intelligent computing environments. This book explores how novel interactive systems can intelligently address various challenges and also limitations previously encountered by human beings using different machine learning algorithms, and analyzes recent trends. The book includes contributions from diverse areas of IIS, here categorized into seven sections, namely i) Intelligent Systems; ii) Autonomous Systems; iii) Pattern Recognition and Computer Vision; iv) E-Enabled Systems; v) Internet & Cloud Computing; vi) Mobile & Wireless Communication; and vii) Various Applications. It not only presents theoretical knowledge on the intelligent and interactive systems but also discusses various applications pertaining to different domains.

Inspired by a new revival of worldwide interest in extra-high-voltage (EHV) and ultra-high-voltage (UHV) transmission, High Voltage Engineering merges the latest research with the extensive experience of the best in the field to deliver a comprehensive treatment of electrical insulation systems for the next generation of utility engineers and electric power professionals. The book offers extensive coverage of the physical basis of high-voltage engineering, from insulation stress and strength to lightning attachment and protection and beyond. Presenting information critical to the design, selection, testing, and operation of a myriad of high-voltage power equipment, this must-have text Discusses power system overvoltages, electric field calculation, and statistical analysis of ionization and breakdown phenomena essential for proper planning and interpretation of high-voltage tests Considers the breakdown characteristics of long air gaps Describes insulation systems currently used in high-voltage engineering, including air insulation and insulators in overhead power transmission lines, gas-insulated substation (GIS) and cables, oil-paper insulation in power transformers, paper-oil insulation in high-voltage cables, and polymer insulation in cables Examines contemporary practices in insulation coordination in association with the International Electrotechnical Commission (IEC) definition and the latest standards Explores high-voltage testing and measuring techniques, from generation of test voltages to digital measuring methods With an emphasis on handling practical situations encountered in the operation of high-voltage power equipment, High Voltage Engineering provides readers with a detailed, real-world understanding of electrical insulation systems, including the various factors affecting—and the actual means of evaluating—insulation performance and their application in the establishment of technical specifications.

High voltage engineering is extremely important for the reliable design, safe manufacture and operation of electric devices, equipment and electric power systems. The 21st International Symposium on High Voltage Engineering, organized by the 90 years old Budapest School of High Voltage Engineering, provides an excellent forum to present results, advances and discussions among engineers, researchers and scientists, and share ideas, knowledge and expertise on high voltage engineering. The proceedings of the conference presents the state of the art technology of the field. The content is simultaneously aiming to help practicing engineers to be able to implement based on the papers and researchers to link and further develop ideas.

The book contains a broad and in depth review by leading world experts of the progress and the problems of current interest in gaseous dielectrics and their use, especially as insulators in high-voltage equipment and substations. Recent advances in superconductivity for power transmission and in plasma technology are also included.The fundamental, applied and industrial research described in the book allows the electric power industry to transmit and distribute electrical energy in more efficient, safe and environmentally acceptable ways.

Gas Insulated Substations (GIS)

Recent Trends in Civil Engineering

Gas Discharge and Gas Insulation

High Voltage Engineering

Gaseous Dielectrics VIII

High Voltage and Electrical Insulation Engineering A comprehensive graduate-level textbook on high voltage insulation engineering, updated to reflect emerging trends and techniques in the field High Voltage and Electrical Insulation Engineering presents systematic coverage of the behavior of dielectric materials. This classic textbook opens with clear explanations of fundamental terminology, electric-field classification, and field estimation techniques. Subsequent chapters describe the field dependent performance of gaseous, vacuum, liquid, and solid dielectrics under different classified field conditions, and illustrate the monitoring of electrical insulation conditions by both single and continuous online methods. Throughout the text, numerous tables, figures, diagrams, and images are provided to strengthen understanding of all material. Fully revised to incorporate the most current technological application techniques, the second edition offers an entirely new section on condition monitoring of electrical insulation. Updated chapters discuss recent developments in gas-filled power apparatus, present-day trends in the use replacement of liquid insulating materials, the latest applications of new solid dielectrics in high voltage engineering, vacuum technology and liquid insulating materials, and more. This edition features a brand-new case study exploring the estimation of clearance requirements for 25 kV electric train. Readers will also find the new edition: Provides new coverage of advances in the field, such as the application of polymer insulators and the use of SF6 gas and its mixtures in gas-insulated systems/Substations (GIS) Uses a novel approach that explores the field dependent behavior of dielectrics Explains the "weck's nonuniform field," a unique concept introduced both conceptually and analytically in Germany A separate chapter provides the new approach to the mechanism of lightning phenomenon, which also includes the phenomenon of "Ball Lightning" The dielectric properties of vacuum and the development in the application of vacuum technology in power circuit breakers is covered in an exclusive chapter In-depth coverage of the performance of the sulphur-hexafluoride gas and its mixtures applicable to the design of Gas Insulated Systems including dry power transformers High Voltage and Electrical Insulation Engineering, Second Edition, remains the perfect textbook for graduate students, teachers, academic researchers, and utility and power industry engineers and scientists involved in the field.

Combining select chapters from Grigsby's standard-setting The Electric Power Engineering Handbook with several chapters not found in the original work, Electric Power Substations Engineering became widely popular for its comprehensive, tutorial-style treatment of the theory, design, analysis, operation, and protection of power substations. For its

Electric Power Substations Engineering provides a comprehensive overview of substations, from their fundamental concepts to their design, automation, operation, and physical and cyber security. Each of its 18 sections is authored by leading members of IEEE's Substations committee and written as a self-contained tutorial, complete with industry stan

Practical Power System and Protective Relays Commissioning is a unique collection of the most important developments in the field of power system setup. It includes simple explanations and cost affordable models for operating engineers. The book explains the theory of power system components in a simple, clear method that also shows how to apply different commissioning tests for different protective relays. The book discusses scheduling for substation commissioning and how to manage available resources to efficiently complete projects on budget and with optimal use of resources. Explains the theory of power system components and how to set the different types of relays Discusses the time schedule for substation commissioning and how to manage available resources and cost implications Details worked examples and illustrates best practices

The Electric Power Engineering Handbook - Five Volume Set

Substations

Proceedings of the 21st International Symposium on High Voltage Engineering

Switchgear Manual

Select Proceedings of TMSF 2019

Advances in High Voltage Insulation and Arc Interruption in SF6 and Vacuum deals with high voltage breakdown and arc extinction in sulfur hexafluoride (SF6) and high vacuum, with special emphasis on the application of these insulating media in high voltage power apparatus and devices. The design and developmental aspects of various high voltage power apparatus using SF6 and high vacuum are highlighted. This book is comprised of eight chapters and opens with a discussion on electrical discharges in SF6 and high vacuum, along with the properties and handling of SF6 gas. The following chapters focus on high voltage breakdown and arc interruption in SF6 and in vacuum; various types of SF6 gas insulated circuit breakers and metal enclosed switchgear, together with their design considerations; and application of SF6 gas in some insulated equipments. The final chapter addresses the various problems relating to the development of vacuum switchgear and considers some solutions that led to the successful development of vacuum interrupters of acceptable quality. This monograph will be of direct use to engineers in industry and those with electricity supply and utility establishments, as well as graduate students and research workers who want to familiarize themselves with the investigations and the results on the various phenomena relating to SF6 and high vacuum and their practical applications.

This book addresses the latest findings on practical ultra-high voltage AC/DC (UHVAC/UHVDC) power transmission. Firstly, it reviews current constructions and future plans for major UHVDC and UHVAC projects around the world. The book subsequently illustrates the basic theories, economic analysis, and key technologies of UHV power networks in detail, and describes the design of the UHVAC substations and UHVDC converter stations and transmission lines. A wealth of clear and specific figures and formulas help readers to understand the fundamental theories underlying UHVAC and UHVDC technologies, as well as their developmental trends. This book is intended for graduate students, researchers and engineers in the fields of power systems and electrical engineering.

Proceedings of the 11th Asia-Pacific Power and Energy Engineering Conference (APPEE 2019), April 19-21, 2019, Xiamen, China

Report on the Second International Survey on High Voltage Gas Insulated Substations (GIS) Service Experience

Ultra-high Voltage AC/DC Power Transmission

High Voltage and Electrical Insulation Engineering

Power System Analysis and Design

The Electric Power Engineering Handbook, Third Edition updates coverage of recent developments and rapid technological growth in crucial aspects of power systems, including protection, dynamics and stability, operation, and control. With contributions from worldwide field leaders—edited by L.L. Grigsby, one of the world’s most respected, accomplished authorities in power engineering—this reference includes chapters on: Nonconventional Power Generation Conventional Power Generation Transmission Systems Distribution

Systems Electric Power Utilization Power Quality Power System Analysis and Simulation Power System Transients Power System Planning (Reliability) Power Electronics Power System Protection Power System Dynamics and Stability Power System Operation and Control Content includes a simplified overview of advances in international standards, practices, and technologies, such as small-signal stability and power system oscillations, power system stability controls, and dynamic modeling of power systems. Each book in this popular series supplies a high level of detail and, more importantly, a tutorial style of writing and use of photographs and graphics to help the reader understand the material. This resource will help readers achieve safe, economical, high-quality power delivery in a dynamic and demanding environment. Volumes in the set: K12642 Electric Power Generation, Transmission, and Distribution, Third Edition (ISBN: 9781439856284) K12648 Power Systems, Third Edition (ISBN: 9781439856338) K13917 Power System Stability and Control, Third Edition (9781439883204) K12650 Electric Power Substations Engineering, Third Edition (9781439856383) K12643 Electric Power Transformer Engineering, Third Edition (9781439856291)

A guide to electrical isolation and switching. It is part of a series of manuals designed to amplify the particular requirements of a part of the 16th Edition Wiring Regulations. Each of the guides is extensively cross-referenced to the Regulations thus providing easy access. Some Guidance Notes contain information not included in the 16th Edition but which was included in earlier editions of the IEE Wiring Regulations. All the guides have been updated to align with BS 7671:2001.

This book comprises peer-reviewed proceedings of the International Conference Trending Moments and Steer Forces – Civil Engineering Today (TMSF 2019). It presents latest research in different domains of civil engineering like structural and concrete engineering, geotechnical engineering, transportation engineering, environmental engineering, and construction technology and management. The contents also include miscellaneous applications of civil engineering in a wide range of technical and societal problems making use of engineering principles and relational data structures involving measurement sciences. Given the range of topics covered, this book can be useful for students, researchers as well as practitioners working in the field of civil engineering.

Explore the diverse electrical engineering application of polymer composite materials with this in-depth collection edited by leaders in the field Polymer Composites for Electrical Engineering delivers a comprehensive exploration of the fundamental principles, state-of-the-art research, and future challenges of polymer composites. Written from the perspective of electrical engineering applications, like electrical and thermal energy storage, high temperature applications, fire retardance, power cables, electric stress control, and others, the book covers all major application branches of these widely used materials. Rather than focus on polymer composite materials themselves, the distinguished editors have chosen to collect contributions from industry leaders in the area of real and practical electrical engineering applications of polymer composites. The books relevance will only increase as advanced polymer composites receive more attention and interest in the area of advanced electronic devices and electric power equipment. Unique amongst its peers, Polymer Composites for Electrical Engineering offers readers a collection of practical and insightful materials that will be of great interest to both academic and industrial audiences. Those resources include: A comprehensive discussion of glass fiber reinforced polymer composites for power equipment, including GIS, bushing, transformers, and more) Explorations of polymer composites for capacitors, outdoor insulation, electric stress control, power cable insulation, electrical and thermal energy storage, and high temperature applications A treatment of semi-conductive polymer composites for power cables In-depth analysis of fire-retardant polymer composites for electrical engineering An examination of polymer composite conductors Perfect for postgraduate students and researchers working in the fields of electrical, electronic, and polymer engineering, Polymer Composites for Electrical Engineering will also earn a place in the libraries of those working in the areas of composite materials, energy science and technology, and nanotechnology.

Advances and Technologies in High Voltage Power Systems Operation, Control, Protection and Security

Power Systems

Gas Insulated Transmission Lines (GIL)

Electric Power Substations Engineering

IEEE Standard for Gas-insulated Substations

Gas Insulated Substations (GIS)I. K. International Pvt Ltd

The insulating medium used in gas-insulated switchgear is SF6 gas, which has been widely used in substations. Energy generated by discharge will cause the composition of SF6 and generate characteristic component gases. Diagnosing the insulation defect through analyzing the decomposed gases of SF6 by chemical gas sensors is the optimal method due to its advantages. Carbon nanotubes, TiO2 nanotubes and graphene are chosen as the gas-sensing materials to build specific gas sensors for detecting each kind of SF6 decomposed gases and then enhance the gas sensitivity and selectivity by material modification. The properties and preparation methods are introduced in this book. The author studied the micro-adsorption mechanism and macro-gas sensing properties by theoretical calculation and sensing experiment.

The electrical demands in several countries around the world are increasing due to the huge energy requirements of prosperous economies and the human activities of modern life. In order to economically transfer electrical powers from the generation side to the demand side, these powers need to be transferred at high-voltage levels through suitable transmission systems and power substations. To this end, high-voltage transmission systems and power substations are in demand. Actually, they are at the heart of interconnected power systems, in which any faults might lead to unsuitable consequences, abnormal operation situations, security issues, and even power cuts and blackouts. In order to cope with the ever-increasing operation and control complexity and security in interconnected high-voltage power systems, new architectures, concepts, algorithms, and procedures are essential. This book aims to encourage researchers to address the technical issues and research gaps in high-voltage transmission systems and power substations in modern energy systems.

Around 80% of electrical consumption in an industrialised society is used by machinery and electrical drives. Therefore, it is key to have reliable grids that feed these electrical assets. Consequently, it is necessary to carry out pre-commissioning tests of their insulation systems and, in some cases, to implement an online condition monitoring and trending analysis of key variables, such as partial discharges and temperature, among others. Because the tests carried out for analysing the dielectric behaviour of insulation systems are commonly standardised, it is of interest to have tools that simulate the real behaviour of those and their weaknesses to prevent electrical breakdowns. The aim of this book is to provide the reader with models for electrical insulation systems diagnosis.

Advances in High Voltage Insulation and Arc Interruption in SF6 and Vacuum

Theory and Practice, Second Edition, Revised and Expanded

High Voltage Metal-enclosed Gas-insulated Substations (GIS).

Vfo Studies Due to Switching Operations in 132 Kv GIS Substation

Nanomaterials Based Gas Sensors for SF6 Decomposition Components Detection

The technical requirements for the design, fabrication, testing, and installation of a gas-insulated substation (GIS) are covered. The parameters to be supplied by the purchaser are set, and the technical requirements for the design, fabrication, testing, and installation to be furnished by the manufacturer are established.

In a Gas insulated substations, the operation of disconnector switches and circuit breakers can cause Very Fast Transient Over voltages (VFTOs), which will bring an instantaneous change in voltage with a very short rise time and it is normally followed by oscillation having high frequencies. For designing the insulation level of a substation, it is essential to know the maximum value of VFTO. Fast operating disconnector switches are usually used to reduce time of the breakdown; however, it cannot eliminate fully the effect of the VFTO. This Book results the most accurate results of Very Fast Transient over Voltages of 132 KV transformer caused by the switching operation. A 132KV transformer is designed using EMTP-RV simulin, the VFTOs generated by the switching operations have been analyzed and are presented. The VFTOs generated due to Disconnector switching operation can cause insulation failure at very high voltage levels. The reasons of these problems are travelling waves which is generated during switching operations in a gas-insulated substation (GIS). Calculation of Very Fast Transient Overvoltage has been carried out using EMTP-RV for various switching.

This book presents a comprehensive overview of research on environmentally friendly insulating gases, in response to the urgent calls for developing alternatives to SF6 due to the increasing awareness of the threat it poses as a greenhouse gas. It covers gas dielectrics, SF6 and its mixtures, and potential alternative gases, providing fundamental information on gas discharge and gas insulation and especially focusing on the development of new environmentally friendly insulating gases over the last decade. The book begins by describing the insulating and arcng characteristics of SF6, followed by an introduction to the gas dielectrics performance of SF6 gas mixtures with buffer gases. The latest findings on new environmentally friendly insulating gases are described in detail, and suggestions for practical application are also provided. Graduate students and teachers involved in high-voltage and insulation engineering can use the book as teaching material. Researchers working in plasma science, laser action and related applied physics fields can also benefit from the book’s analytical approach and detailed data; engineers from the fields of electric power operation systems and electrical manufacturing will find it a valuable reference work for solving practical problems.

The Conference will focus on recent advances in key information technologies It will provide a remarkable opportunity for the academic and industrial community to address new challenges and share solutions, and discuss future research directions

Practical Power System and Protective Relays Commissioning

Gaseous Dielectrics X

Gas Insulated Substations

Simulation and Modelling of Electrical Insulation Weaknesses in Electrical Equipment

2019 16th International Computer Conference on Wavelet Active Media Technology and Information Processing

Comprehensive reference covering all aspects of gas insulated substations including basic principles, technology, use & application, design, specification, testing and ownership issues This book provides an overview on the particular development steps of gas insulated high-voltage switchgear, and is based on the information given with the editor’s tutorial. The theory is kept low only as much as it is needed to understand gas insulated technology, with the main focus of the book being on delivering practical application knowledge. It discusses some important and advanced aspects in the meaning of applications. The start of the book presents the theory of Gas Insulated Technology, and outlines reliability, design, safety, grounding and bonding, and factors for choosing GIS. The third chapter presents the technology, design, safety, and the assembly process. Gas Insulated BUs, and the assembly process. Next, the book goes into control and monitoring, which covers local control cabinet, bay controller, control schemes, and digital communication. Testing is explained in the middle of the book before installation and energization. Importantly, operation and maintenance is discussed. This chapter includes information on repair, extensions, retrofit or upgrade, and overvoltage. Finally applications are covered along with concepts of layout, typical layouts, mixed technology substations, and then other topics such as life cycle assessment, environmental impact, and project management. A one-stop, complete reference text on gas insulated substations (GIS), large-capacity and long-distance electricity transmission, which are of increasing importance in the power industry today Details advanced and basic material, accessible for both existing GIS users and those planning to adopt the technology Discusses both the practical and theoretical aspects of GIS Written by acknowledged GIS experts who have been involved in the development of the technology from the start

Power and Energy Engineering are important and pressing topics globally, covering issues such as shifting paradigms of energy generation and consumption, intelligent grids, green energy and environmental protection. The 11th Asia-Pacific Power and Energy Engineering Conference (APPEEC 2019) was held in Xiamen, China from April 19 to 21, 2019. APPEEC has been an annual conference since 2009 and has been successfully held in Wuhan (2009 & 2011), Chengdu (2010 & 2017), Shanghai (2012 & 2014), Beijing (2013 & 2015), Suzhou (2016) and Guilin (2018). China. The objective of APPEEC 2019 was to provide scientific and professional interactions for the advancement of the fields of power and energy engineering. APPEEC 2019 facilitated the exchange of insights and innovations between industry and academia. A group of excellent speakers have delivered keynote speeches on emerging technologies in the field of power and energy engineering. Attendees were given the opportunity to give oral and poster presentations and to interface with invited experts.

The increase in demand for electricity and the growing energy density in metropolitan cities have made it necessary to extend the existing high voltage network right up to the consumer. Stepping down the voltage from transmission to the distribution level at the substations located near the actual consumers not only yields economic advantages, but also ensures reliable power supply. Such substations are required to meet a number of severe requirements, including small installation size, effective protection against atmospheric pollution and moisture, noiseless operation, nonexplosive and flame resistant, reduced maintenance, minimal radio interference while providing excellent electric characteristics. Conventional substations using atmospheric air as the main dielectric cannot satisfy these requirements, but totally enclosed substations using sulphur hexafluoride (SF6) gas insulation that are also known as Gas Insulated Substations (GIS). GIS is now in widespread use in the electrical power industry, especially in metropolitan areas. This book will serve as a valuable reference for the novice as well as the expert who needs a wider and detailed scope of coverage within the area of GIS. Gas Insulated Substations provides a comprehensive coverage of a wide range of topics which include: " Introduction to GIS & Properties of SF6 " Layout, Design, Construction, Testing & Maintenance of GIS " Special Problems and Diagnostic Techniques " VFTO Phenomena and its Effects in GIS " Service Experience " Standards Specifications " Future Trends " Extensive References Gas Insulated Substations (GIS) is the first single source for authoritative information on the state of the art in GIS.

Today’s readers learn the basic concepts of power systems as they master the tools necessary to apply these skills to real world situations with POWER SYSTEM ANALYSIS AND DESIGN, 6E. This new edition highlights physical concepts while also giving necessary attention to mathematical techniques. The authors develop both theory and modeling from simple beginnings so readers are prepared to readily extend these principles to new and complex situations. Software tools and the latest content throughout this edition aid readers with design issues while reflecting the most recent trends in the field. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Polymer Composites for Electrical Engineering

Advances in Intelligent Systems and Interactive Applications

Emerging Developments in the Power and Energy Industry

Proceedings of the 4th International Conference on Intelligent, Interactive Systems and Applications (ISA2019)

Gas-insulated transmission lines (GIL) is an established high voltage technology used when environmental or structural considerations restrict the use of overhead transmission lines. With an overview on the technical, economical and environmental impact and power system implications of GIL, this guide provides a complete understanding of its physical design, features and advantages. The author illustrates how to evaluate when GIL would be the best solution during the planning sequence and how to apply GIL in the electricity power network. Other key features include: operation and maintenance requirements with information on repair processes, duration, and different monitoring systems enabling the achievement of reliable and safe operation; a wide variety of realized applications from across the world over the past 35 years, illustrating typical fields of application through descriptions of real projects that the author has worked on; and future application possibilities in a smart transmission network, used for solving power system problems. This is an essential reference for engineers involved in planning and executing bulk power transmission projects overground, in tunnels or buried. It offers a concise summary of all areas of the subject and is the perfect aid for utility power engineers, consulting engineers and manufacturers worldwide.

Power Systems, Third Edition (part of the five-volume set, The Electric Power Engineering Handbook) covers all aspects of power system protection, dynamics, stability, operation, and control. Under the editorial guidance of L.L. Grigsby, a respected and accomplished authority in power engineering, and section editors Andrew Hanson, Pritindra Chowdhuri, Gerry Sheblé, and Mark Nelms, this carefully crafted reference includes substantial new and revised contributions from worldwide leaders in the field. This content provides convenient access to overviews and detailed information on a diverse array of topics. Concepts covered include: Power system analysis and simulation Power system transients Power system planning (reliability) Power electronics Updates to nearly every chapter keep this book at the forefront of developments in modern power systems, reflecting international standards, practices, and technologies. New sections present developments in small-signal stability and power system oscillations, as well as power system stability controls and dynamic modelling of power systems. With five new and 10 fully revised chapters, the book supplies a high level of detail and, more importantly, a tutorial style of writing and use of photographs and graphics to help the reader understand the material. New chapters cover: Symmetrical Components for Power System Analysis Transient Recovery Voltage Engineering Principles of Electricity Pricing Business Essentials Power Electronics for Renewable Energy A volume in the Electric Power Engineering Handbook, Third Edition Other volumes in the set: K12642 Ele

The book contains a broad and in depth review by leading world experts of the progress and the problems of current interest in gaseous dielectrics and their use, especially as insulators in high-voltage equipment and substations. Recent advances in superconductivity for power transmission and in plasma technology are also included. The fundamental, applied and industrial research described in the book allows the electric power industry to transmit and distribute electrical energy in more efficient, safe and environmentally acceptable ways.

"Bridges the gap between laboratory research and practical applications in industry and power utilities-clearly organized into three distinct sections that cover basic theories and concepts, execution of principles, and innovative new techniques. Includes new chapters detailing industrial uses and issues of hazard and safety, and review exercises to accompany each chpter."

Insulation Performance Of Sf(6) Gas Insulated Switchgear (gis) Stressed With High Frequency Oscillating Voltage Transients

Volume 2

Isolation and Switching

Power and Energy

Proceedings of the International Conference on Power and Energy (CPE 2014), Shanghai, China, 29-30 November 2014

Seventy-six papers from the June 1998 symposium discuss recent advances and developments in many basic, applied, and industrial areas of gaseous dielectrics. They are divided into sections covering: basic physics of gaseous dielectrics, basic mechanisms, simulations/breakdown in gas mixtures, partial discharges/diagnostics, high pressure gas dielectrics, gas decomposition/particles, environmental aspects/recycling, surface discharges/design engineering, and gas-insulated equipment. Some papers are followed by a short discussion. Also included are transcripts from two discussion groups—other industrial applications of gaseous dielectrics and data bases, and SF6 substitutes. Annotation copyrighted by Book News, Inc., Portland, OR

High-Voltage Engineering