

ASCE Manuals and Reports on Engineering Practice No. 113

# Substation Structure Design Guide

Second Edition



**Recommended Practice for Design and Use**

Task Committee on Substation Structure Design

Edited by George T. Watson, P.E.

**ASCE**



# Substation Guide

**Albert Sutton Richey, William Charles  
Greenough**

## Substation Guide:

**Electric Power Substations Engineering** John D. McDonald, 2016-04-19 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 **Gas Insulated Substations** Hermann J. Koch, 2014-08-11 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 introductory 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 covering the following in detail manufacturing specification instrument transformers 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 overloading 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 **Critical Urban Infrastructure Handbook** Masanori Hamada, 2014-12-18 A reference for engineers and facilities professionals involved in the planning operations management and maintenance of all urban utilities this handbook addresses water supply and sewerage power gas telecommunications joint utility corridor utilidor lifeline facilities and other critical civil infrastructure lifelines It covers the design and construction of facilities maintenance disaster management environmental protection and disaster and emergency recovery measures It also discusses urban planning life cycle cost GIS analysis of lifeline systems computerized integrated management systems and the use of new materials and technologies **Ultra-High Voltage AC/DC Grids** Zhenya Liu, 2014-12-11 The UHV transmission has many advantages for new power networks due to its capacity long distance potential high efficiency and low loss Development of UHV transmission technology is led by infrastructure development and renewal as well as smart grid

developments which can use UHV power networks as the transmission backbone for hydropower coal nuclear power and large renewable energy bases Over the years State Grid Corporation of China has developed a leading position in UHV core technology R D equipment development plus construction experience standards development and operational management SGCC built the most advanced technology two AC and two DC UHV projects with the highest voltage class and largest transmission capacity in the world with a cumulative power transmission of 10TWh This book comprehensively summarizes the research achievement theoretical innovation and engineering practice in UHV power grid construction in China since 2005 It covers the key technology and parameters used in the design of the UHV transmission network shows readers the technical problems State Grid encountered during the construction and the solution they come up with It also introduces key technology like UHV series compensation DC converter valve and the systematic standards and norms Discusses technical characteristics and advantages of using of AC DC transmission system Includes applications and technical standards of UHV technologies Provides insight and case studies into a technology area that is developing worldwide Introduces the technical difficulties encountered in design and construction phase and provides solutions *IEEE Guide for Design of Substation Rigid-bus Structures*, 1999 Rigid bus structures for outdoor and indoor air insulated and alternating current substations are covered Portions of this guide are also applicable to strain bus structures or direct current substations or both Ampacity radio influence vibration and forces due to gravity wind fault current and thermal expansion are considered Design criteria for conductor and insulator strength calculations are included

### **Standard Handbook for Electrical Engineers**

**Sixteenth Edition** H. Wayne Beaty, Donald Fink, 2012-08-30 THE MOST COMPLETE AND CURRENT GUIDE TO ELECTRICAL ENGINEERING For more than a century the Standard Handbook for Electrical Engineers has served as the definitive source for all the pertinent electrical engineering data essential to both engineering students and practicing engineers It offers comprehensive information on the generation transmission distribution control operation and application of electric power Completely revised throughout to address the latest codes and standards the 16th Edition of this renowned reference offers new coverage of green technologies such as smart grids smart meters renewable energy and cogeneration plants Modern computer applications and methods for securing computer network infrastructures that control power grids are also discussed Featuring hundreds of detailed illustrations and contributions from more than 75 global experts this state of the art volume is an essential tool for every electrical engineer Standard Handbook for Electrical Engineers 16th Edition covers Units symbols constants definitions and conversion factors Electric and magnetic circuits Measurements and instruments Properties of materials Generation Prime movers Alternating current generators Direct current generators Hydroelectric power generation Power system components Alternate sources of power Electric power system economics Project economics Transmission systems High voltage direct current power transmission Power system operations Substations Power distribution Wiring design for commercial and industrial buildings Motors and drives Industrial and

commercial applications of electric power Power electronics Power quality and reliability Grounding systems Computer applications in the electric power industry Illumination Lightning and overvoltage protection Standards in electrotechnology telecommunications and information technology    Standard Handbook for Electrical Engineers, Seventeenth Edition Surya Santoso,H. Wayne Beaty,2017-11-24 Up to date coverage of every facet of electric power in a single volume This fully revised industry standard resource offers practical details on every aspect of electric power engineering The book contains in depth discussions from more than 100 internationally recognized experts Generation transmission distribution operation system protection and switchgear are thoroughly explained Standard Handbook for Electrical Engineers Seventeenth Edition features brand new sections on measurement and instrumentation interconnected power grids smart grids and microgrids wind power solar and photovoltaic power generation electric machines and transformers power system analysis operations stability and protection and the electricity market Coverage includes Units symbols constants definitions and conversion factors Measurement and instrumentation Properties of materials Interconnected power grids AC and DC power transmission Power distribution Smart grids and microgrids Wind power generation Solar power generation and energy storage Substations and switch gear Power transformers generators motors and drives Power electronics Power system analysis operations stability and protection Electricity markets Power quality and reliability Lightning and overvoltage protection Computer applications in the electric power industry Standards in electrotechnology telecommunications and IT

**Substation Structure Design Guide** George T. Watson,2023 MOP 113 second edition documents electrical substation structural design practice and gives guidance and recommendations for the design of outdoor electrical substation structures

**Climatic Guide for Selected Locations in Ohio** Marvin E. Miller,1969    *Substation Structure Design Guide* Leon Kempner,2008 MOP 113 provides a comprehensive resource for the structural design of outdoor electrical substation structures    Electric Railway Handbook Albert Sutton Richey,William Charles Greenough,1915    *The Chicago Electrical Handbook* American Institute of Electrical Engineers,1904    **Network Protection & Automation Guide** ,2002

*Electric Light and Power* ,1927    **Electric Distribution Systems Engineering Handbook** ,1994    *IEEE Standards* Institute of Electrical and Electronics Engineers,1997    **McGraw-Hill's National Electrical Safety Code 2017 Handbook 4E (PB)** David J. Marne,2016-10-20 Achieve full 2017 NESC compliance with this hands on guide McGraw Hill s National Electrical Safety Code NESC 2017 Handbook thoroughly explains how to apply and meet the NESC rules for electric supply stations and equipment as well as overhead and underground electric supply and communications lines Designed to be used alongside the Code itself this comprehensive resource has been fully updated to reflect the record number of change proposals for the 2017 NESC Focusing on practical application of the 2017 Code this Handbook delivers a rule by rule annotation of the NESC that clarifies potentially confusing Code text and allows you to perform your work safely and confidently Hundreds of diagrams photos and practical examples make this the most complete and useful handbook available

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