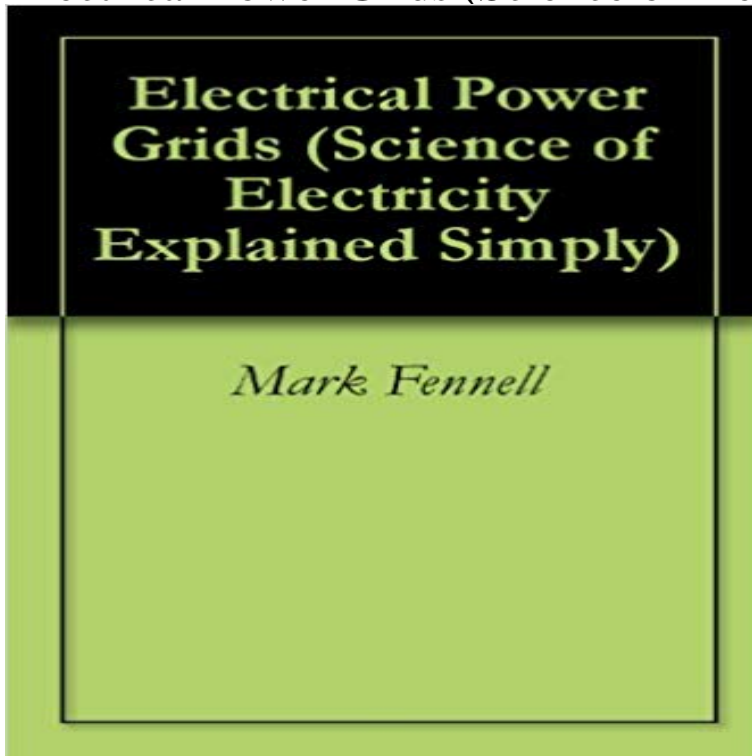


Electrical Power Grids (Science of Electricity Explained Simply)



This book explains the technologies and processes of grids. In this book you will learn everything about grid operations, power distribution, and reliability. You will also learn about smart grids and the future of power distribution. This book is designed for policy-makers, legislators, community activists, curious citizens, and energy technology students. This book will also be an essential reference for working in the electrical power industry. No technical background is required, this book will explain everything you need to know about the operation of power grids in a way that everyone can understand. Chapter one provides an overview of grids, including an overview of operations and limitations. Chapter two discusses the grid operators, including Independent System Operators (ISOs), Regional Transmission Organizations (RTOs) and the Federal Energy Regulatory Commission (FERC). Chapter three explains the sequence of grid operations. We first discuss the most basic types of grid operations, then we add various factors into the system. We also discuss long-term contracts and ancillary services. Chapter four discusses the important concept of quality control of grids. We provide a list of the most important factors which will ensure quality control, and how the grid operators can manage those factors for optimum reliability. Chapter five discusses a practical implication of grid operations: grid failures. In chapter five we discuss the primary causes of grid failures and methods to reduce grid failures. We discuss the North American Electrical Reliability Council and their work in ensuring reliability. We also discuss the threat of terrorist acts on grids. In chapter six we discuss the future of electrical distribution: smaller grids, smaller power plants, and local energy production. Note that unlike mainstream thought which encourages larger and more interconnected grids, this

book focuses on a smarter approach. The author agrees with a growing number of power engineers who believe that smaller grids, smaller power plants, and local energy production are the keys to our future. Therefore, this chapter lays out all the reasoning from those energy experts. In this chapter we explain the many benefits of smaller power plants, smaller grids, and local energy distribution. We discuss how this vision will increase reliability, grow the economy, and prevent power failures. We will also explain how we can do all these things at a lower cost and at a faster rate than is currently done under current mainstream political philosophy.

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