

<<核电专业英语>>

图书基本信息

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## 前言

核电工程技术涉及的学科领域广泛，包含很多高新技术。

目前，美、英等发达国家在该领域处于领先地位，很多新的研究成果和新技术的介绍都以英文发表，每个从事核电工程研究、设计和运行的专业人员都需要阅读大量的英文资料。

为了满足越来越多的核电工程专业人员学习专业英语的需要，编写了本书。

本书内容涵盖了核电工程所涉及的主要学科，在介绍核反应堆物理及核反应堆热工等基础知识的同时，也介绍了各种类型的核反应堆及主要设备的原理和使用特性等。

主要内容包括：核反应堆物理的基础知识、核材料、核反应堆热工水力学、反应堆结构、核动力系统和主要设备、核反应堆运行及核安全、核动力的发展及新一代反应堆等。

本书内容广泛，选用不同风格的文章，做到内容新、知识面宽；选用的课文概念性和知识性强、难度适中，不涉及复杂的专业理论。

为了便于读者掌握专业词汇，每课课后对重要的关键词作了英、中文两种解释，同时还列出了重要的词汇解释、课文中的难点注释。

为了加深读者对课文内容的理解，课后还附有习题和答案。

本书的内容安排由浅入深、由基础到专业，可适合不同层次的学生使用。

全书围绕着核电工程这一主题，在专业部分中以新一代压水堆核电站动力装置为主线，介绍了目前运行的核电技术以及新一代的核电技术。

书中的每一课都有相当的独立性，可以根据学生的兴趣和专业方向选择使用，同时也考虑了课文内容满足总体需要，保证全书内容是一个完整的整体。

本书的阅读内容取自英文的原版教科书和工程设计说明书。

书中的引文，编者尽力与版权所有取得联系，但仍有部分联系不上，在此深表歉意。

全书共20个单元，由哈尔滨工程大学阎昌琪教授编写，由中国原子能科学研究院阮於珍研究员主审，阮老师提出了许多宝贵的意见和建议，在此深表谢意。

由于编者水平所限，书中难免存在缺点和不足，敬请读者提出宝贵意见。

## 内容概要

本书为普通高等教育核工程与核技术专业规划教材。

本书的内容涵盖了与核电有关的基础理论知识和专业知识，介绍了反应堆结构、核动力系统和设备，也包括了近年来核电的新发展，例如第三代和第四代反应堆的介绍。

书中涉及的核电专业词汇广泛、内容丰富、知识性强。

为了便于读者掌握专业词汇，每课课文后对重要的关键词作了英、中文两种解释，同时还列出了重要的词汇解释、课文中的难点注释。

为了加深读者对课文内容的理解，课后还附有习题和答案。

本书可作为普通高等教育本科核工程与核技术专业的英语阅读教材，也可作为核电工程技术人员的培训和自学用书，同时可作为能源动力类等相关专业人员的阅读材料。

## 书籍目录

前言 Unit 1 The Basic Concepts for Nuclear Physics 1.1 Atoms and Nuclei 1.2 Isotopes 1.3 Mass Defect 1.4 Binding Energy 1.5 Energy Levels 1.6 Fission Self-test 关键字解释 词汇 课文注释 Unit 2 Radiation 2.1 Radioactivity 2.2 Excitation and Ionization by Electrons 2.3 Heavy Charged Particle Slowing by Atoms 2.4 Heavy Charged Particle Scattering by Nuclei 2.5 Gamma Ray Interactions with Matter 2.6 The Properties of Alpha, Beta and Gamma Radiation Self-test 关键字解释 词汇 课文注释 Unit 3 Nuclear Materials 3.1 Fuels 3.2 Moderators 3.3 Coolants 3.4 Cladding Materials 3.5 Control Materials Self-test 关键字解释 词汇 课文注释 Unit 4 The Theory of Nuclear Reactors 4.1 The Chain Reaction 4.2 The Neutron Cycle in a Thermal Reactor 4.3 Conversion and Breeding 4.4 Fuel Cycles Self-test 关键字解释 词汇 课文注释 Unit 5 Nuclear Reactor Concepts 5.1 Power Reactors 5.2 Consumption of Nuclear Fuels 5.3 Reactor Control 5.4 Other Effects on Reactor Operation 5.5 The Fast Breeder Reactor 5.6 Uranium as an Energy Resource Self-test 关键字解释 词汇 课文注释 Unit 6 Nuclear Reactor Thermohydraulics 6.1 Methods of Heat Transmission 6.2 Conduction in Reactor Fuel 6.3 Heat Removal by Coolant 6.4 Boiling Heat Transfer Self-test 关键字解释 词汇 课文注释 Unit 7 Pressurized water Reactor 7.1 General 7.2 Pressurized Water Reactor Components 7.3 Introduction to the Nuclear Steam Supply System 80+ Self-test 关键字解释 词汇 课文注释 Unit 8 Reactor vessel and Internals 8.1 Reactor Vessel 8.2 Reactor Vessel Internals Self-test 关键字解释 词汇 课文注释 Unit 9 Reactor Core and Fuel 9.1 Introduction 9.2 Core 9.3 Fuel Rod 9.4 Fuel Assembly 9.5 Control Element Assemblies and Drive Mechanisms 9.6 Control Element Drive Mechanisms (CEDM) 9.7 Neutron Sources 9.8 Burnable Absorber Rod Assembly Self-test 关键字解释 词汇 课文注释 Unit 10 The Main Components in PWR Coolant System 10.1 Steam Generators 10.2 Pressurizer 10.3 Reactor Coolant Pumps and Motors Self-test 关键字解释 词汇 课文注释 Unit 11 Pressurized Water Reactor Systems and Containment 11.1 Plant Heat Balance and the Steam Cycle 11.2 PWR Primary and Secondary Loops 11.3 Auxiliary system for Primary Loop 11.4 Containment Self-test 关键字解释 词汇 课文注释 Unit 12 The Steam Turbine 12.1 Introduction 12.2 Classification of Turbines 12.3 Impulse and Reaction Blading 12.4 Velocity Compounding Curtis Stage 12.5 The Reaction-Turbine Principle 12.6 Reaction Blading 12.7 Sealing Arrangement 12.8 Twisted and Tapered Blades 12.9 Erosion Control and Moisture Removal 12.10 Other Blade Features 12.11 Low Pressure Turbine 12.12 Turbine Control Self-test 关键字解释 词汇 课文注释 Unit 13 Main Steam, Feed and Condensate Systems 13.1 Introduction 13.2 Main Steam and Feedwater Piping 13.3 Main Steam Piping System Flow Restrictor 13.4 Safety Requirements 13.5 Feed and Condensate System Description 13.6 Transients 13.7 Controls Self-test 关键字解释 词汇 课文注释 Unit 14 Operation of a Nuclear Power Plant 14.1 Introduction 14.2 Plant Safety 14.3 Plant Operations 14.4 Normal Mode 14.5 Abnormal Mode 14.6 Off-Normal (Upset) Mode 14.7 Control Rooms and Instrumentation 14.8 System Parameters Self-test 关键字解释 词汇 课文注释 Unit 15 Radiation Hazards and Shielding 15.1 Introduction 15.2 Health Physics 15.3 The Biological Effects of Radiation Exposure 15.4 The Effects of Inhaled and Ingested Radioactivity 15.5 Reactor Shielding Self-test 关键字解释 词汇 课文注释 Unit 16 Nuclear Safety 16.1 Safety and Hazards in Nuclear Power 16.2 Reactor Accidents 16.3 The Accident at Three Mile Island 16.4 The Accident at Chernobyl Self-test 关键字解释 词汇 课文注释 Unit 17 Westinghouse AP1000 Advanced Passive Plant 17.1 Introduction 17.2 Major Equipment Description 17.3 Safety Through Simplicity 17.4 Passive Safety Systems 17.5 Probabilistic Risk Assessment 17.6 Simplification 17.7 Cost and Construction Schedule 17.8 Licensing 17.9 AP1000 Deployment 17.10 Conclusions Self-test 关键字解释 词汇 课文注释 Unit 18 European Pressurized Water Reactor (EPR) 18.1 Introduction 18.2 Construction Schedule 18.3 Operation, Maintenance and Services 18.4 Operational Flexibility 18.5 Safety Systems 18.6 Primary System Self-test 关键字解释 词汇 课文注释 Unit 19 The Heavy-Water-Moderated Reactor 19.1 General Characteristics of the Heavy Water Reactor 19.2 The CANDU Pressure Tube Heavy Water Reactor 19.3 Advanced CANDU Reactor Self-test 关键字解释 词汇 课文注释 Unit 20 Generation IV Nuclear Power 20.1 Introduction 20.2 The Gas-Cooled Fast Reactor (GFR) 20.3 Very-High-Temperature Reactor System (VHTR) 20.4 Supercritical Water-Cooled Reactor (SCWR) 20.5 Sodium-Cooled Fast Reactor (SFR) 20.6 Lead-Cooled Fast Reactor (LFR) 20.7 Molten Salt Reactor (MSR) 20.8

Generation IV and the Hydrogen Economy Self-test 关键字解释 词汇 课文注释附录 Self-test习题答案附录 词汇表参考文献

## 章节摘录

The further development of the British system, the advanced gas-cooled reactor (AGR), uses graphite as a moderator and a somewhat enriched fuel to compensate for the fact that the fuel is contained in stainless steel, which absorbs a significant fraction of the neutrons. We shall describe and discuss all the above reactors, and in particular their cooling problems, in the following chapters. However, before doing so, it may be interesting to glance back to prehistoric times. The light water-cooled and moderated reactors have been around far longer than one might imagine. In fact, the invention of Enrico Fermi was preempted by nature approximately 2 billion years earlier. In 1972, evidence was found of the dormant remains of a natural fission reactor located at Oklo, in the West African Republic of Gabon. This natural reactor operated for a period of hundreds of thousands of years. Its existence was discovered by an intriguing piece of detective work by French nuclear scientists. In May 1972, H. Bouzigue obtained a curious result during a routine analysis of standard samples of uranium ore from Gabon. He found that they contained about 0.4% less  $^{235}\text{U}$  than expected. This was not due to an error in his analysis or to a natural variation. On this planet, at any particular time, the ratio of  $^{235}\text{U}$  to  $^{238}\text{U}$  is fixed; some other explanation had to be found for the discrepancy. A careful investigation carried out by the French Atomic Energy Agency traced the abnormal ore to one particular location in Oklo. It was concluded that the deficiency in  $^{235}\text{U}$  could be explained only by the occurrence of a natural fission reaction at the site. At the time this natural reactor was operating, the ore was buried deep underground and natural groundwater served as a moderator and to some extent as a coolant. Such a reactor would not be possible with the present-day concentration of  $^{235}\text{U}$  in naturally occurring uranium, as we explained above. However, it should be remembered that the half-life of  $^{235}\text{U}$  is about 700 million years and that of  $^{238}\text{U}$  is about 4.5 billion years. Thus, in prehistoric times, the concentration of  $^{235}\text{U}$  was much higher than it is today. When the earth was formed some 4.6 billion years ago, the concentration of  $^{235}\text{U}$  in natural uranium was about 25%, and it had decreased to about 3% at the time when the Oklo reactor was operating.

### 编辑推荐

本书内容涵盖了核电工程所涉及的主要学科，在介绍核反应堆物理及核反应堆热工等基础知识的同时，也介绍了各种类型的核反应堆及主要设备的原理和使用特性等。

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