

<<火电厂专业英语>>

图书基本信息

书名：<<火电厂专业英语>>

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内容概要

全书共分七部分，55个单元，总阅读量为280000词左右。

内容以锅炉、汽轮机和发电机三大主机为主体，广泛涉及大型机组的设备、材料、运行和管理等方面，瞄准向火电厂培养“全能值班员”这一目标，在本教材中还设置了火电厂的设计规划和厂址选择、自动控制、电厂化学和环境等内容，尤其是许多诸如洁净煤技术、DEH控制系统、燃气-蒸汽联合循环技术、烟气脱硫技术、计算机控制等高新技术，对工程技术人员掌握当今技术极有帮助。

此外，考虑到目前大多数火电厂项目采用国际竞争招标，本教材特别设置了有关招标的内容。

所有英文选自近年出版的英文原版书刊和文献，内容丰富，新颖。

全书共涉及1175个生词及专业词汇，专业词汇覆盖面宽。

全书的内容排列不仅保持了火电厂专业知识的系统性，而且符合英语教学的特点。

为便于读者使用，每单元附有词汇表，全书后附有总词汇表，并配有参考译文。

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书籍目录

第一部分 电厂规划设计 第一单元 中国的电力工业 第二单元 电厂设计 第三单元 厂址选择 第四单元 运行规则 第五单元 厂户与钢结构 第六单元 洁净煤技术 第二部分 锅炉 第一单元 锅炉及其发展 第二单元 锅炉布置 第三单元 锅炉燃料 第四单元 燃烧设备 第五单元 锅炉炉膛 第六单元 过热器与再热器 第七单元 省煤器和空气预热器 第八单元 Drax电站的燃煤机组 第三部分 汽轮机设备 第一单元 汽轮机原理 第二单元 汽轮机的分类 第三单元 汽缸结构 第四单元 转子和叶轮结构 第五单元 喷嘴和动叶 第六单元 辅助设备 第七单元 调速器及调节机构 第八单元 D-EHG数字电液调节和保护系统 第九单元 Drax电站的汽轮机 第十单元 燃气轮机 第四单元 发电机和电气设备 第一单元 发电机 第二单元 发电机的基本原理和结构 第三单元 发电机保护 第四单元 Drax电厂的发电机 第五单元 变电站 第六单元 变电站辅助系统 第七单元 变压器 第八单元 实际变压器 第九单元 保护系统 第十单元 具体保护措施 第十一单元 接地与电缆 第五部分 控制理论及其应用 第一单元 控制理论 第二单元 锅炉控制 第三单元 汽机控制 第四单元 计算机在电厂中的应用 第五单元 优于PID的先进控制软件 第六单元 可编程控制器 第六部分 电厂化学与环境 第一单元 水处理技术(I) 第二单元 水处理技术(II) 第三单元 离子交换 第四单元 锅炉防垢 第五单元 废水处理 第六单元 润滑特性 第七单元 煤 第八单元 烟气脱硫 第七部分 招标 第一单元 国际招标 第二单元 开标、评价和授予合同 第三单元 确认 第四单元 中国标准标书 第五单元 合同一般条款(I) 第六单元 合同一般条款(II) 参考文献

章节摘录

Unit Eight Drax Coal-Fired Power Station Steam Drum The steam drum is an all welded cylindrical construction supported by two Uslings from the steelwork. The drum was manufactured in one piece at the factory and was transported to the site by sea. It has a length of 30.40 m and an internal diameter of 2.29 m. Its weight with the internal fittings is 335 t. Four rows of 65 conical cyclone separators are fitted in the drum and above each separator is an inclined primary scrubber. Secondary scrubbers are fitted at a higher level close to the saturated steam takeoffs. The drum is made from high tensile steel and no welding is permitted on the drum after it has been stress relieved. Apertures in a girth baffle allow the combined steam and water mixture to enter

cyclone separators which are arranged in pairs, in two rows along the front and the rear of the steam drum. The steam and water mixture enters each cyclone body tangentially and whirls around the inside of the cylinder producing a powerful vortex, within which a positive separation of steam and water occurs. The steam collects in the centre and passes out at the top, whilst the water moves downward in a helical path and passes back into the drum water space for recirculation through the furnace walls. The saturated steam flows upwards through the primary inclined scrubbers which remove water residue that may be carried over by the steam after leaving the separator. The steam then passes through secondary scrubbers, fitted at the top of the drum, which provide a final separation of water from the steam before it leaves the drum and flows into the superheating circuits. Draught System. The draught system comprises two forced draught (FD) fans, two induced draught (ID) fans, two rotary air heaters and three electrostatic precipitators. Air for combustion is supplied to the burner registers by the two FD fans by way of air preheaters where the boiler flue gases heat the incoming air. The effluent gases are drawn through three electrostatic dust precipitators by the ID fans which then discharge the gases to the chimney. The furnace is balanced by the FD and ID fans to maintain a pressure just below atmosphere. The FD and ID fans are mechanically similar, the ID fans having a higher maximum duty specification. The fans are electrically driven at constant speed and the air or gas volumes are controlled by radial inlet guide vanes. Gas air heaters are used to provide a means of heating the air supplied to the furnace in order to assist combustion and provide for a more economical use of fuel. They are supported by the main boiler structural steelwork at the firing floor level, and located at the rear of the furnace enclosure; one fitted on each side of the boiler beneath the gas outlet flues. The air heaters are of contra-flow design, the combustion air from the FD fans passing upwards through the units to the burners, via the hot air ducts, whilst the furnace gases from the boiler outlet flues pass downwards through the units to the precipitators. The two streams, which flow through diametrically opposite segments of the rotor, are separated from each other by a small blanking section fitted with sealing plates which forms a division between them.

Each of the air heaters is fitted with its own combined sootblowing and water washing gear, fire detection and fire fighting equipment and a pressure fed oil system for lubricating the rotor bearings. The rotor, which is 14.4 m in diameter, is the central part of the air heater and contains the heat transfer matrix. Each rotor has a nominal heating surface of 51 826 m². Radial plates extending from the hub divide the rotor into 24 sectors which in turn are sub-divided at the hot and intermediate ends by sector division plates which strengthen the rotor and carry the hot and intermediate end element containers. At the cold end of the rotor, grids welded between the radial division plates perform the same duty as the sector division plates, but enable the cold end element containers to be radially withdrawn from the air heater. The weight of the rotor is carried on the underside by a spherical roller thrust bearing whilst at the top a spherical roller guide bearing is provided to resist radial loads. The rotor is driven by a small electric induction motor coupled to the rotor hub through a double worm reducer and spur gearing.

Precipitators Three electrostatic precipitators per boiler are fitted in each gas discharge line to collect dust from the boiler flue gases. The precipitators achieve a collecting efficiency of 99.5% with a gas inlet temperature of 120 °C and volume per boiler of 803.2 m³/s. Dust-laden flue gases are directed through the zones of each precipitator in which discharge and collecting electrodes are situated. A variable high voltage dc current is supplied to the electrodes. The precipitators, which are mounted on steel support structures above ground level, comprise six rows in series of dust-collecting plates forming multiple parallel gas paths and with discharge electrodes

wires suspended vertically within these paths. Boiler flue gases are directed by baffles in the inlet flare to flow evenly through the precipitator via gas passages formed by the spaces between the collecting plates. The cleaned gases are extracted by the ID fans and vented to atmosphere through the station chimney. The dust which accumulates mainly on the collecting plates but also on the discharge wires is removed at intervals by mechanically rapping the plates and wires. The dislodged dust falls into hoppers suspended below the precipitators and supported by the steel structure. Accumulated dust in the hoppers is removed by the dust disposal plant to which the hopper outlets are connected. The generation and control of the high voltage (HV) systems, rapping control systems and heating systems are located at ground level on the gas inlet side of the precipitators.

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媒体关注与评论

序 随着我国改革开放的深入和经济的发展,我国电力工业迅速发展,尤其是火电厂建设迈上了一个新台阶,引进机组和设备不断增加,对外交流日益频繁。

广大火电厂建设、管理和运行的科技人员和工作人员以及相关专业的在校大、中专学生,迫切需要掌握英语这一对外交往的工具,学习先进技术,促进对外交流。

作为一所全国重点大学,武汉水利电力大学每年向国家输送大量电力建设专业人才。

由于国家经济体制的进一步改革,电力工业无论在深度和广度上都发生了深刻的变化。

因此,对人才素质的要求越来越高。

为了适应这一变化,武汉水利电力大学以“211工程”为契机,深入教育改革,发展学科建设,充实、更新教学内容,推出了一批深受学生和社会好评的教材和教科书。

唐必光和谢诞梅等同志所编的这本《火电厂专业英语》教材,是他们在武汉水利电力大学任教期间,瞄准向火电厂培养“全能值班员”这一目标,根据学生、尤其是广大现场工作人员的实际要求,并结合自己的教学经验编写而成的。

全书以锅炉、汽轮机和发电机三大主机为主线,广泛涉及大型机组(600 MW和300 MW)的结构、原理、运行和管理等内容,还包括火电厂的设计规划及厂址选择、自动控制、电厂化学及环境和招标等内容。

特别值得一提的是,这本书还涉及诸如洁净煤技术、DEH控制系统、燃气—蒸汽联合循环技术、烟气脱硫技术、计算机控制等许多高新技术。

全书内容新颖,专业词汇覆盖面广,生词重复率高。

全书的内容编排不仅保持了火电厂专业知识的系统性,而且符合英语教学的特点。

因此,我很高兴地向广大读者推荐这本教材。

希望并相信它对与火电厂有关的在校本专科学生、研究生和工程技术人员学习英语、并掌握当今技术发展能有所裨益。

1999.6.5

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