石油科技英语系列教程

丛书主编 ◎ 吴松林 江淑娟

Natural Gas Development-Transportation and Distribution

天然气开发与输配

刘亚丽 葛多虹 吴冠乔 ◎ 编著

English

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内 容 提 要

本书是介绍天然气历史、天然气开发、天然气市场现状与市场监管、天然气储运、天然气供应及相关法规、新技术及环境保护等方面知识的英语学习教程。

本书可作为天然气相关专业的师生和石油系统员工学习石油科技英语的参考书。

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《石油科技英语系列教程》
编 委 会

前 言

全球石油资源分布、生产及消费三者之间存在着严重的地区失衡，中东和亚太是失衡最严重的地区，中东地区严重供过于求，亚太地区严重供不应求。因此能源行业出现了全球化发展趋势，能源国际的交流与合作日益密切。为保证中国能源安全，中国石油和石化行业国际化和本土化发展势在必行。中国油气企业正在积极进行海外业务拓展，了解资源地区的文化背景、经济发展状况、能源开发政策并掌握其石油地质结构、油气成藏条件、开发和炼制技术等，将有利于我们对资源地区的油气开发和炼制，更有力地支持中国经济的快速发展。

自 1993 年起，为了解决石油院校和石油职工专业英语教材的严重匮乏问题，本丛书主编陆续在黑龙江人民出版社、黑龙江科技出版社、石油工业出版社等出版了系列专业石油英语教科书，积累了一定的编写经验、培训经验和图书项目导向经验。20 年过去了，石油行业也发生了巨大的变化，新油气资源不断发现，开采与炼制等技术不断更新，海外合作区域也不断拓宽。为了适应新形势，我们开始编写一套更大规模的《石油科技英语系列教程》丛书，既包括石油上、中、下游生产技术，也包括世界主要石油资源国的经济、贸易和文化等，目的是为读者奠定通向世界石油领域话语权的语言基础。

我们深感责任重大，从中国石油大学、东北大学、东北石油大学、西安石油大学及各油田石油地质研究院、设计院等单位聘请有关专家学者，确定编写体例，搜集资料。在选材上注重内容的系统性，争取覆盖本领域主要内容；语言方面，注意遴选突出科技英语语言特点的语段和篇章，并对语言使用方法做详尽解释，以英语基础知识和基本技能的培养为主。为降低学习难度，为每篇课文还配写了汉语译文，以提高学生的石油科技英语阅读、翻译及写作能力。

《天然气开发与输配》分册本着英语语言能力与经济背景知识相结合的原则，在文章的选材上，注意了以下几个方面：(1)侧重英语基础知识和基本

技能的培养;(2)介绍与天然气相关的知识,使学生掌握专业背景和技术知识;(3)培养和提高学生的英语阅读和翻译能力;(4)为进一步进行相关专业学习打下基础。

本书共分两章,从天然气的历史及市场、天然气开发两个不同角度,向读者介绍天然气的历史、供求关系、市场现状、市场监管及天然气勘探、开采、数据分析、新技术开发、环保和运输等的行业知识。在每篇课文内,为了能够让读者更好地掌握课文内容,均列出导读、相关的专业词汇及词组翻译、重点句子讲解,并跟进与重点内容相关的问题。读者在回答问题的同时,可以巩固对课文的理解,进而掌握相关背景知识。学习这些课文,不但能巩固和强化专业知识,也能使读者了解到本行业研究的深度和广度,并学会如何检索、阅读、写作和评价,为研究工作打下坚实的基础。为降低学习的难度,本书对文化背景中所涉及的专业词汇尽可能做了详细的介绍。

由于编著者水平有限,书中难免出现不足之处,敬请读者批评指正。

丛书主编:　吴松林　江淑娟

2015 年 12 月

Contents

Chapter 1 Natural Gas History and Market

This chapter helps to get a better understanding of natural gas by introducing its history knowledge and market development: the structure of the industry and the market, the relationship between demand and supply, the distribution system and how to regulate the market system.

1.1 History

Guidance to Reading

The natural gas industry has existed and developed in this country for over 100 years. New technologies are continually developed to use natural gas in new and exciting ways. With all of the advantages of natural gas, it is no wonder that it has become the fuel of choice in this country, and throughout the world.

Text

Natural gas is nothing new. In fact, most of the natural gas that is brought out from under the ground is millions and millions of years old. However, it was not until recently that methods for obtaining this gas, bringing it to the surface, and putting it to use were developed.

Before there was an understanding of what natural gas was, it **posed** somewhat of a mystery to man. Sometimes, such things as lightning strikes would **ignite** natural gas that was escaping from under the earth's crust. This would create a fire coming from the earth, burning the natural gas as it **seeped** out from underground. These fires puzzled most early civilizations, and were the root of much myth and superstition. One of the most famous of these types of flames was found in ancient Greece, on Mount Parnassus approximately 1000 B. C. A goat herdsman came across what looked like a "burning spring", a flame rising from a **fissure** in the rock. The Greeks, believing it to be of **divine** origin, built a temple on the flame. This temple housed a priestess who was known as the Oracle of Delphi, giving out **prophecies** she claimed were **inspired** by the flame.

These types of springs became prominent in the religions of India, Greece, and Persia. Unable to explain where these fires came from, they were often regarded as divine, or supernatural. It wasn't until about 500 B. C. that the Chinese discovered the potential to use these fires to their advantage. Finding places where gas was seeping to the surface, the Chinese formed pipelines out of bamboo to transport the gas, where it was used to boil brine, separating the salt and making it drinkable.

Britain was the first country to **commercialize** the use of natural gas. Around 1785, natural gas produced from coal was used to light houses, as well as streetlights.

Manufactured natural gas of this type (as opposed to naturally occurring gas) was first brought to the United States in 1816, when it was used to light the streets of Baltimore, Maryland. However, this manufactured gas was much less efficient, and less environmentally friendly, than modern natural gas that comes from underground.

Naturally occurring natural gas was discovered and identified in America as early as 1626, when French explorers discovered natives igniting gases that were seeping into and around Lake Erie. The American natural gas industry got its beginnings in this area. In 1859, Colonel Edwin Drake (a former railroad conductor who adopted the title "Colonel" to impress the townspeople) dug the first well. Drake hit oil and natural gas at 69 feet below the surface of the earth.

Most in the industry characterize this well as the beginning of the natural gas industry in America. A two-inch diameter pipeline was built, running 5 and 1/2 miles from the well to the village of Titusville, Pennsylvania. The construction of this pipeline proved that natural gas could be brought safely and relatively easily from its underground source to be used for practical purposes.

In 1821, the first well specifically intended to obtain natural gas was dug in Fredonia, New York by William Hart. After noticing gas bubbles rising to the surface of a **creek**, Hart dug a 27-foot well to try and obtain a larger flow of gas to the surface. Hart is regarded by many as the "father of natural gas" in America. Expanding on Hart's work, the Fredonia Gas Light Company was eventually formed, becoming being the first American natural gas company.

During most of the 19th century, natural gas was used almost **exclusively** as

a source of light. Without a pipeline **infrastructure**, it was difficult to transport the gas very far, or into homes to be used for heating or cooking. Most of the natural gas produced in this era was manufactured from coal, **as opposed to** transported from a well. Near the end of the 19th century, with the rise of electricity, natural gas lights were converted to electric lights. This led producers of natural gas to look for new uses for their product.

In 1885, Robert Bunsen invented what is now known as the Bunsen burner. He managed to create a device that mixed natural gas with air in the right **proportions**, creating a flame that could be safely used for cooking and heating. The invention of the Bunsen burner opened up new opportunities for the use of natural gas in America, and throughout the world. The invention of temperature-regulating **thermostatic** devices allowed for better use of the heating potential of natural gas, allowing the temperature of the flame to be **adjusted** and **monitored**.

Without any way to transport it effectively, natural gas discovered pre-WWII was usually just allowed to **vent** into the atmosphere, or burnt, when found alongside coal and oil, or simply left in the ground when found alone.

One of the first lengthy pipelines was constructed in 1891. This pipeline was 120 miles long, and carried natural gas from wells in central Indiana to the city of Chicago. However, this early pipeline was very **rudimentary**, and was not very efficient at transporting natural gas. It wasn't until the 1920s that any significant effort was put into building a pipeline infrastructure. After World War II, **welding** techniques, pipe rolling, and **metallurgical** advances **allowed for** the construction of reliable pipelines. This post-war pipeline construction boom lasted well into the '60s, and allowed for the construction of thousands of miles of pipeline in America.

Once the transportation of natural gas was possible, new uses for natural gas were discovered. These included using natural gas to heat homes and operate appliances such as water heaters and oven ranges. Industry began to use natural gas in manufacturing and processing plants. Also, natural gas was used to heat boilers used to generate electricity. The transportation infrastructure had made natural gas easy to obtain, and it was becoming an increasingly popular form of energy.

A Brief History of Regulation

In 1938, the U. S. government first regulated the natural gas industry. At the time, members of the government believed the natural gas industry to be a "natural **monopoly**". Because of the fear of possible abuses, such as charging unreasonably high prices, and given the rising importance of natural gas to all consumers, the Natural Gas Act was passed. This Act **imposed** regulations and restrictions on the price of natural gas to protect consumers. In the 1970s and 1980s, a number of gas shortages and price irregularities indicated that a regulated market was not best for consumers or the natural gas industry. Into the 1980s and early 1990s, the industry gradually moved toward less regulation, allowing for healthy competition and market-based prices. These moves led to a strengthening of the natural gas market, lowering prices for consumers and allowing for a great deal more natural gas to be discovered. Although not as active as the 1990s, the beginning of the 21st Century has brought with it significant regulation concerning gas quality, standards of conduct for interstate pipelines, and price reporting.

Today, the natural gas industry is regulated by the Federal Energy Regulatory Commission (FERC). While FERC does not deal exclusively with natural gas issues, it is the primary rule making body **with respect to** the regulation of the natural gas industry.

Competition characterizes the natural gas industry as it is known today. The restructuring of the industry, and the move away from strict regulation, has allowed for increased efficiency and technological improvements. Natural gas is now being obtained more efficiently, cheaply, and easily than ever before. However, the search for more natural gas to serve our ever growing demand requires new techniques and knowledge to obtain it from hard-to-reach places.

Today, the natural gas industry has existed in this country for over 100 years, and it continues to grow. Restructuring and the move toward cleaner-burning fuels have created an enormous market for natural gas across the country. New technologies are continually developed that allow Americans to use natural gas in new and exciting ways. With all of the advantages of natural gas, it is no wonder that it has become the fuel of choice in this country, and throughout the world.

Words and Expressions

pose	vt. & vi. 使摆姿势;招摇 vt. 提出;造成(威胁、问题等) n. 姿势;姿态
ignite	vt. 点燃;使燃烧;使激动;使灼热 vi. 点火;燃烧
seep	vi. (液体)渗;渗透;渗出;漏出
fissure	n. 狭长裂缝或裂隙;裂伤;分歧;分裂 vt. & vi. 裂开
divine	adj. 神的,天赐的;极好的;神圣的
prophecy	n. 预言;预言能力;预言书
inspire	vt. 鼓舞;激励;赋予灵感;启迪
commercialize	vt. (尤指不择手段地)利用……牟利,商业化
creek	n. 小湾;小河,小溪;弯曲狭窄的通路
exclusively	adv. 唯一地;专门地,特定地;专有地;排外地
infrastructure	n. 基础设施;基础建设
proportion	n. 比,比率 vt. 使成比例;使相称;使均衡
thermostatic	adj. 温度调节装置的
adjust	vt. & vi. (改变……以)适应,调整,校正;调准(望远镜等)
monitor	vt. 监控,监听 n. 显示屏;[计]显示器;监测仪;监控人员,班长
vent	vt. & vi. 表达,发泄(感情,尤指愤怒);给……开孔;放出
rudimentary	adj. 基本的,初步的;发育不完全的,未成熟的;退化的
weld	vt. & vi. 焊接;使紧密结合
metallurgical	adj. 冶金学的
monopoly	n. 垄断;专卖;垄断者;专利品
impose	vt. 强加;征税;以……欺骗

Phrases and Expressions

as opposed to	(表示对比)而,相对于
allow for	考虑到;体谅;允许有;留出
with respect to	关于,(至于)谈到

Language Focus

1. . . . it was not until recently that methods for obtaining this gas, bringing it to the surface, and putting it to use were developed.

(参考译文:直到近些年,发现天然气、开采到地表并将其投入到实际应用中的方法才得以发展。)

本句中,it was. . . that. . . 是英语中常见的强调句型。该句的强调部分是 not until recently,是原句的时间状语。后面的词组 bringing it to the surface 和 putting it to use 均与 obtaining this gas 并列,作介词 for 的宾语。

2. Finding places where gas was seeping to the surface, the Chinese formed pipelines out of bamboo to transport the gas, where it was used to boil brine, separating the salt and making it drinkable.

(参考译文:他们找到气体渗透到地表的地方,用竹筒制成管道来输送气体,用它来加热卤水,把盐分离出来,将卤水变为饮用水。)

本句中 finding places. . . 是现在分词短语,作整个句子的状语成分。Where. . . 是非限制性定语从句,先行词为 bamboo shooots。Separating. . . 是现在分词短语,是非限制性定语,先行词为前面的定语从句。

3. Into the 1980s and early 1990s, the industry gradually moved toward less regulation, allowing for healthy competition and market-based prices.

(参考译文:80 年代到 90 年代初,该行业逐渐向减少调控、允许健康竞争和市场定价的方向转变。)

本句中介词 into 是"进入"的意思,该介宾短语作时间状语。Allowing for. . . 是非限制性定语,先行词是前面的整个句子。

4. Although not as active as the 1990s, the beginning of the 21st Century has brought with it significant regulation concerning gas quality, standards of conduct for interstate pipelines, and price reporting.

(参考译文:尽管不像 20 世纪 90 年代那样强势,21 世纪初,政府仍然就天然气质量、州际管道生产标准和价格报告等方面进行了必要的监管。)

本句中 although 与后面的形容词短语一起作状语,修饰后面的句子。

5. With all of the advantages of natural gas, it is no wonder that it has become the fuel of choice in this country, and throughout the world.

(参考译文:新技术持续发展,使美国人以一种全新的、令人愉悦的方式继续使用该能源。天然气优点诸多,难怪它已成为美国乃至全世界人们选择的燃料。)

本句中，介词 with 可以翻译成“随着”，与后面的名词短语构成接宾短语，作伴随状语。it is no wonder that 翻译成“难怪”，其中 it 是形式主语，that 引导主语从句。

Reinforced Learning

Ⅰ. Answer the following questions for a comprehension of the text.

1. When did human beings discover the potential to use natural gas to their advantage?

2. Which was the first country to commercialize the use of natural gas?

3. When and who dug the first well?

4. When did the first lengthy pipelines be constructed?

5. What kind of new uses for natural gas were discovered after the transportation of it was possible?

Ⅱ. Multiple choice: choose the correct one from the alternative answers to give the exact meaning of the word.

1. Sometimes, such things as lightning strikes would ignite natural gas that was escaping from under the earth's crust.

A. running out　　B. evaperating　　C. steaming　　D. flaming

2. The Greeks, believing it to be of divine origin, built a temple on the flame.

A. divided　　B. good　　C. holy　　D. human

3. Britain was the first country to commercialize the use of natural gas.

A. communitized　　B. marketed　　C. socialized　　D. civilized

4. Most in the industry characterize this well as the beginning of the natural gas industry in America.

A. identify　　B. civilize　　C. relativize　　D. define

5. The invention of temperature-regulating thermostatic devices allowed for better use of the heating potential of natural gas, allowing the temperature of the flame to be adjusted and monitored.

A. considered　　B. made for　　C. figured for　　D. left

6. The invention of temperature-regulating thermostatic devices allowed for better use of the heating potential of natural gas, allowing the temperature of the flame to be adjusted and monitored.

A. adopted B. explored C. modified D. adapted

7. Without any way to transport it effectively, natural gas discovered pre-WWII was usually just allowed to vent into the atmosphere, or burnt, when found alongside coal and oil, or simply left in the ground when found alone.

A. excrete B. conduct C. air D. invent

8. However, this early pipeline was very rudimentary, and was not very efficient at transporting natural gas.

A. elementary B. necessary C. primary D. simple

9. This Act imposed regulations and restrictions on the price of natural gas to protect consumer.

A. posed B. positioned C. forced D. impersonalized

10. Although not as active as the 1990s, the beginning of the 21st Century has brought with it significant regulation concerning gas quality, standards of conduct for interstate pipelines, and price reporting.

A. respecting B. regarding C. caring D. concording

Ⅲ. Multiple choice: read the four suggested translations and choose the best answer.

1. While FERC does not deal exclusively with natural gas issues, it is the primary rule making body with respect to the regulation of the natural gas industry.

A. 关于 B. 尊重 C. 期待 D. 延迟

2. This post-war pipeline construction boom lasted well into the '60s, and allowed for the construction of thousands of miles of pipeline in America.

A. 爆炸 B. 清扫 C. 高峰 D. 提高

3. Unable to explain where these fires came from, they were often regarded as divine, or supernatural.

A. 被看作 B. 被轻视 C. 被考虑 D. 被尊重

4. Drake hit oil and natural gas at 69 feet below the surface of the earth.

A. 打击 B. 开采 C. 撞到 D. 冲击

5. In 1821, the first well specifically intended to obtain natural gas was dug in Fredonia, New York by Hart.

A. 准备 B. 假设 C. 使用 D. 为了

Ⅳ. Put the following sentences into Chinese.

1. ... it was not until recently that methods for obtaining this gas, bringing it to the surface, and putting it to use were developed.

2. The invention of temperature-regulating thermostatic devices allowed for better use of the heating potential of natural gas, allowing the temperature of the flame to be adjusted and monitored.

3. Into the 1980s and early 1990s, the industry gradually moved toward less regulation, allowing for healthy competition and market-based prices.

4. Although not as active as the 1990s, the beginning of the 21st Century has brought with it significant regulation concerning gas quality, standards of conduct for interstate pipelines, and price reporting.

5. With all of the advantages of natural gas, it is no wonder that it has become the fuel of choice in this country, and throughout the world.

Ⅴ. Put the following paragraphs into Chinese.

1. Before there was an understanding of what natural gas was, it posed somewhat of a mystery to man. Sometimes, such things as lightning strikes would ignite natural gas that was escaping from under the earth's crust. This would create a fire coming from the earth, burning the natural gas as it seeped out from underground. These fires puzzled most early civilizations, and were the root of much myth and superstition. One of the most famous of these types of flames was found in ancient Greece, on Mount Parnassus approximately 1000 B. C. A goat herdsman came across what looked like a "burning spring", a flame rising from a fissure in the rock. The Greeks, believing it to be of divine origin, built a temple on the flame. This temple housed a priestess who was known as the Oracle of Delphi, giving out prophecies she claimed were inspired by the flame.

2. In 1938, the U. S. government first regulated the natural gas industry. At the time, members of the government believed the natural gas industry to be a "natural monopoly". Because of the fear of possible abuses, such as charging unreasonably high prices, and given the rising importance of natural gas to all consumers, the Natural Gas Act was passed. This Act imposed regulations and restrictions on the price of natural gas to protect consumers. In the 1970s and 1980s, a number of gas shortages and price irregularities indicated that a regula-

ted market was not best for consumers or the natural gas industry. Into the 1980s and early 1990s, the industry gradually moved toward less regulation, allowing for healthy competition and market-based prices. These moves led to a strengthening of the natural gas market, lowering prices for consumers and allowing for a great deal more natural gas to be discovered. Although not as active as the 1990s, the beginning of the 21st Century has brought with it significant regulation concerning gas quality, standards of conduct for interstate pipelines, and price reporting.

1.2 Marketing

Guidance to Reading

This text gives an adequate introduction to the history and development of the natural gas market and the knowledge concerned, including its features and history as a commodity, the types and characteristics of the market, the trading and distributors.

Text

Natural gas marketing is a relatively new addition to the natural gas industry, beginning in the mid-1980's. **Prior to** the **deregulation** of the natural gas commodity market and the introduction of open access for everyone to natural gas pipelines, there was no role for natural gas marketers. Producers sold to pipelines, who sold to local distribution companies and other large volume natural gas users. Local distribution companies sold the natural gas purchased from the pipelines to retail end users, including commercial and residential customers. Price regulation at all levels of this supply chain left no place for others to buy and sell natural gas. However, with the newly **accessible** competitive markets introduced gradually over the past fifteen years, natural gas marketing has become an **integral** component of the natural gas industry. In fact, the first marketers were a direct result of interstate pipelines attempting to **recoup** losses associated with long term contracts entered into as a result of the oversupply problems of the early 1980s.

Natural gas marketing may be defined as the selling of natural gas. In even looser terms, marketing can be referred to as the process of coordinating, at vari-