21世纪高等学校工程管理系列规划教材

工程管理专业英语

Specialty English for Project Management

◎ 主编 孟宪强 王凯英

机械工业出版社
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免费电子课件

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机械工业出版社

本书以培养和提高读者阅读和笔译工程管理专业英语文献资料的能力为目标，增加了工程英语对话，具有一定的实用性。

本书素材选自近年来国内外工程管理各领域的经典教材、专著、论文，内容涉及工程管理各领域当前的状况和最新进展。本书主要内容包括项目管理体系、工程管理专业概论、工程项目前期策划、工程项目投标和招标管理、工程合同管理、工程成本管理、工程进度管理、工程施工现场管理、工程质量与安全、工程信息管理、工程风险管理、工程索赔、争端和仲裁、国际工程商务谈判。本书内容新颖、覆盖面广、系统性强、可读性好，是学习工程管理专业英语的实用教材。

本书既可供高等院校的工程管理专业和土木工程相关专业师生使用，也可作为工程管理专业人员及其他有兴趣人员的学习参考书。

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前　言

随着世界经济全球化的深入发展，工程项目管理国际化水平不断提高，努力学习和借鉴国际上先进的工程项目管理经验，在学习中借鉴、研究，不断提高工程管理水平，需要工程管理专业学生及工程管理从业人员有效阅读国外相关工程资料，掌握与国际工程项目相关的法规、条例及专业知识，能够与他人进行有效沟通。

本书分为15个单元，包括项目管理体系、工程管理专业概论、工程项目前期策划、工程项目投标和招标管理、工程合同管理、工程成本管理、工程进度管理、工程施工现场管理、工程质量与安全、工程信息管理、工程风险管理、工程索赔、争端和仲裁、国际工程商务谈判。

本书每单元的构成体现了循序渐进的学习原则。各单元的结构基本相同，每单元包括以下两部分内容：

Part I　Reading and Translating（阅读与翻译）

Professional Knowledge Guidance（专业知识导读）：本部分有别于其他书籍，是学习前的热身，加入部分中文专业知识点，目的是使学生回忆学过的专业知识内容，帮助学生对所学习的单元内容有总体的把握。

Text（课文）：每课课文与主题对应，篇幅完整。主要目的是帮助读者学习专业知识和专业词汇，掌握阅读技巧，能理解并正确通顺地翻译。本部分包括**New Words and Phrases**（生词及短语）、**Notes**（注释）、**Exercises**（练习）。**New Words and Phrases**为课文所涉及的专业、半专业词汇及相关短语。**Notes**给出重点例句的参考译文，旨在帮助读者通过阅读课文深刻理解专业知识内涵，并掌握英汉互译的表达方式。**Exercises**分为专业短语汉译英，及重点长难句英译汉，旨在帮助读者进一步通过练习掌握短语表达，以及长难句翻译技巧和方法，并进一步理解专业知识的中英文表达。

Passage A、**Passage B**为补充课文内容，提供了两篇课外阅读材料，并给出生词及短语，目的是保持专业知识的完整性以及扩充学生的词汇量。教师可根据情况决定是否课堂讲授。

Part II　Speaking（工程英语实用对话）

本书工程英语实用对话部分，以FIDIC条款为依据，表达方式通俗易懂；模拟对话场景，极具实用性；覆盖了一般工程管理活动中的主要环节。

本书由北华大学孟宪强、盐城工学院王凯英任主编，北华大学高爽、王淋任副主编。具体的编写分工为：孟宪强编写Unit 1、Unit 3、Unit 13，王凯英编写Unit 2、Unit 6、Unit

15，武汉理工大学彭自强编写 Unit 4、Unit 7，王淋编写 Unit 5、Unit 11，高爽编写 Unit 10、Unit 12，黑龙江工程学院李晓琳编写 Unit 8、Unit 9 单元，东北电力大学史巍编写 Unit 14。

本书参考了许多行业相关技术规范以及国内外大量的著作、教材、论文及其他研究成果，在此，对这些作者表示感谢！由于作者水平有限，书中难免有诸多不足，敬请各位读者批评指正。

编　者

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Unit 1
Management System

Part I Reading and Translating

Professional Knowledge Guidance

1. 项目管理知识体系：是由美国项目管理学会（Project Management Institute，PMI）在1987年首先提出，PMI公布了第一个项目管理知识体系（Project Management Body of Knowledge，PMBOK），于1996年推出第1版，2017年修订为第6版。在这个知识体系中，把项目管理的知识划分为9个领域，分别是项目集成管理（Project Integration Management）、项目范围管理（Project Scope Management）、项目时间管理（Project Time Management）、项目费用管理（Project Cost Management）、项目质量管理（Project Quality Management）、项目人力资源管理（Project Human Resource）、项目沟通管理（Project Communication Management）、项目风险管理（Project Risk Management）和项目采购管理（Project Procurement Management）。

2. 中国项目管理知识体系：2001年7月推出了第1版，2006年10月推出第2版，中国项目管理知识体系文件——《中国项目管理知识体系》（Chinese Project Management Body of Knowledge，C-PMBOK）。

Text

Introduction to Project Management

Need for Project Management

In most construction contracts, the contractor is given only one opportunity to set its price (the bid). From that point on, profits are determined by the project manager's ability to save money through better planning of daily operations and the skill to make good decisions. If a project is to be constructed within its established budget and time schedule, close management control of field operations is a necessity. Project

conditions such as technical complexity, importance of timely completion, resource limitations, and substantial costs put great emphasis on the planning, scheduling, and control of construction operations. Unfortunately, the construction process, once set into motion, is not a **self-regulating mechanism** and requires expert guidance if events are to conform to plans.

It must be remembered that projects are one-time and largely unique efforts of limited time duration that involve work of a non-standardized and variable nature. Field construction work can be affected profoundly by events that are difficult, if not impossible, to anticipate. Under such uncertain and shifting conditions, field construction costs and time requirements are changing constantly and can seriously **deteriorate** with little or no advance warning. The presence of uncertainty in construction does not suggest that planning is impossible but rather that it will assume a **monumental** role in the success or failure of the project. The greater the level of uncertainty in the project, the greater the need for exhaustive project planning and skilled and unremitting management effort.

Under most competitively bid, fixed-sum contracts calling for construction services only, the general contractor exercises management control over construction operations. Self-interest is the essential motivation in such cases, the contractor being obligated by contract to meet a prescribed completion date and to finish the project for a **stipulated** sum. The surest way for the contractor to achieve its own objectives, and those of the owner in the bargain, is by applying some system of project management.

Serving the best interests of the owner is the primary emphasis of project control under other forms of contracts. Field management under design-construct, construction management, and many cost-plus contracts is directed principally toward providing the owner with professional advisory and management services to best achieve the owner's objectives. [1]

Project Management Characteristics

In its most common context, the term "management" relates to the planning, organizing, directing, and controlling of a business enterprise. Business management is essentially a continuing and internal activity involving that company's own personnel, finances, property, and other resources. Construction project management, however, applies to a given project, the various phases of which usually are accomplished by different organizations. Therefore, the management of a construction project is not so much a process of managing the internal affairs of a single company as it is one of coordinating and regulating all of the elements needed to accomplish the job at hand. [2] Thus, the typical project manager must work extensively with organizations other than his own. In such circumstances, much of his authority is conferred by contractual terms or power of agency and is therefore less direct than that of the usual business manager. Project management is accomplished largely through the personnel of different employers working closely together.

Discussion Viewpoint

As mentioned previously, the responsibility for field construction management rests with different parties, depending on owner preference and the nature of the contracting procedure. Whether the owner, architect engineer, general contractor, or a construction manager performs such duties is very much a matter of context. The basics of the pertinent management procedures are essentially the same, however, regardless

of the implementing party. Nevertheless, to show detailed workings and examples of such management methods, it is necessary to present the material from the specific viewpoint of one of these parties. Thus, where the nature of the discussion requires such designation, the treatment of management methods herein will be from the particular viewpoint of the general contractor.

Management Procedures

Field construction has little in common with the assembly-line production of standardized products. Standard costs, time-and-motion studies, process flowcharts, and line-of-balance techniques—all traditional management devices used by the manufacturing industries—have not lent themselves well to general construction applications.[3] Historically, construction project management has been a **rudimentary** and largely **intuitive** process, aided by the useful but inadequate bar chart.

Over the years, however, new scientific management concepts have been developed and applied. Application of these principles to construction has resulted in the development of techniques for the management control of construction cost, time, resources, and project finance, treating the entire construction process as a unified system. Comprehensive management control is applied from inception to completion of construction operations.

Field project management starts with the onset of construction, at which point a comprehensive construction budget and detailed time schedule of operations are prepared. These constitute the accepted cost and time goals used as a blueprint for the actual construction process. After the project has begun, monitoring systems are established to measure the actual costs and progress of the work at periodic intervals. The reporting system provides progress information that is measured against the programmed targets. Comparison of field expense and progress with the established plan quickly detects exceptions that must receive prompt management attention. Data from the system can be used to make corrected forecasts of costs and time to complete the work.

The process just described is often called a management-by-exception procedure. When applied to a given project, it emphasizes the prompt and explicit identification of deviations from an established plan or norm. Reports that highlight exceptions from the standard enable the manager to recognize quickly those project areas requiring attention. As long as an item of work is progressing in accordance with the plan, no action is needed, but there are always plenty of problem areas that do require attention.

In addition to cost and time, the field management system is necessarily concerned with the management of job resources and with project financial control. Resources in this context refer to materials, labor, construction equipment, and subcontractors. Resource management is primarily a process of the advance recognition of project needs, scheduling and expediting of the resources required, and adjusting the demands where necessary.[4] Project financial control involves the responsibility of the project manager for the total cash flow generated by the construction work and the terms of the contract.

As indicated by the preceding discussion, there are several different aspects of a project control system. It must be recognized, however, that these aspects are highly interrelated segments of a total project management process.

New Words and Phrases

deteriorate 恶化，变坏；磨损；解体
monumental 非常的；不朽的
stipulated 规定的；约定的
rudimentary 基本的；初步的；退化的；残遗的
intuitive 直觉的；凭直觉获得的
self-regulating mechanism 自我约束机制

Notes

[1] Field management under design-construct, construction management, and many cost-plus contracts is directed principally toward providing the owner with professional advisory and management services to best achieve the owner's objectives.

设计—施工、项目管理及大量成本补偿合同下的项目现场管理主要是针对业主的，为其提供专业咨询及管理服务，以最大程度实现其目标。

[2] Therefore, the management of a construction project is not so much a process of managing the internal affairs of a single company as it is one of coordinating and regulating all of the elements needed to accomplish the job at hand.

因此，建设项目管理不仅仅是管理单一公司内部事务的过程，也是协调和规范与即将完成的该项工作的所有相关事项的过程。

[3] Standard costs, time-and-motion studies, process flowcharts, and line-of-balance techniques—all traditional management devices used by the manufacturing industries—have not lent themselves well to general construction applications.

标准成本、时间和作业效率研究、流程图以及平衡线法等所有制造业运用的传统管理方法，还没有很好地应用到一般的建筑管理上。

[4] Resources in this context refer to materials, labor, construction equipment, and subcontractors. Resource management is primarily a process of the advance recognition of project needs, scheduling and expediting of the resources required, and adjusting the demands where necessary.

本文中提到的资源是指材料、劳力、建筑设备及分包商。资源管理主要是提前识别项目需求、必需资源的计划和支出、必要时的需求调整等流程或活动。

Exercises

I. Translate the following phrases into English.

1. 项目管理知识体系
2. 项目阶段
3. 项目收益管理计划
4. 项目与开发生命周期
5. 工程项目质量管理

II. Translate the following sentences into Chinese.

1. If a project is to be constructed within its established budget and time schedule, close management control of field operations is a necessity.

2. In its most common context, the term "management" relates to the planning, organizing, directing, and controlling of a business enterprise.

3. As mentioned previously, the responsibility for field construction management rests with different parties, depending on owner preference and the nature of the contracting procedure.

4. In addition to cost and time, the field management system is necessarily concerned with the management of job resources and with project financial control.

5. Project financial control involves the responsibility of the project manager for the total cash flow generated by the construction work and the terms of the contract.

Passage A

The Project Life Cycle

The acquisition of a constructed **facility** usually represents a major capital investment, whether its owner happens to be an individual, a private corporation or a public agency. Since the commitment of resources for such an investment is motivated by **market demands** or perceived needs, the facility is expected to satisfy certain objectives within the constraints specified by the owner and relevant regulations. With the exception of **the speculative housing market**, where the residential units may be sold as built by **the real estate developer**, most constructed facilities are custom made in consultation with the owners. A real estate developer may be regarded as the sponsor of building projects, as much as a **government agency** may be the sponsor of a **public project** and turns it over to another government unit upon its completion. From the viewpoint of **project management**, the terms "owner" and "sponsor" are synonymous because both have the ultimate authority to make all important decisions. Since an owner is essentially acquiring a facility on a promise in some form of agreement, it will be wise for any owner to have a clear understanding of the acquisition process in order to maintain firm control of the quality, timeliness and cost of the completed facility.

From the perspective of an owner, the project life cycle for a constructed facility may be illustrated schematically in Figure 1-1. Essentially, a project is conceived to meet market demands or needs in a timely fashion. Various possibilities may be considered in **the conceptual planning stage**, and the technological and economic **feasibility** of each alternative will be assessed and compared in order to select the best possible project. The financing schemes for the proposed alternatives must also be examined, and the project will be programmed with respect to the timing for its completion and for available cash flows. After the scope of the project is clearly defined, detailed engineering design will provide the blueprint for construction, and the definitive cost estimate will serve as the baseline for cost control. In the procurement and construction stage, the delivery of materials and the erection of the project on site must be carefully planned and controlled. After the construction is completed, there is usually a brief period of start-up or shake-down of the constructed facility when it is first occupied. Finally, the management of the facility is turned over to the owner for full occupancy until the facility lives out its useful life and is designated for demolition or conversion.

Of course, the stages of development in Figure 1-1 may not be strictly sequential. Some of the stages require iteration, and others may be carried out in parallel or with overlapping time frames, depending on

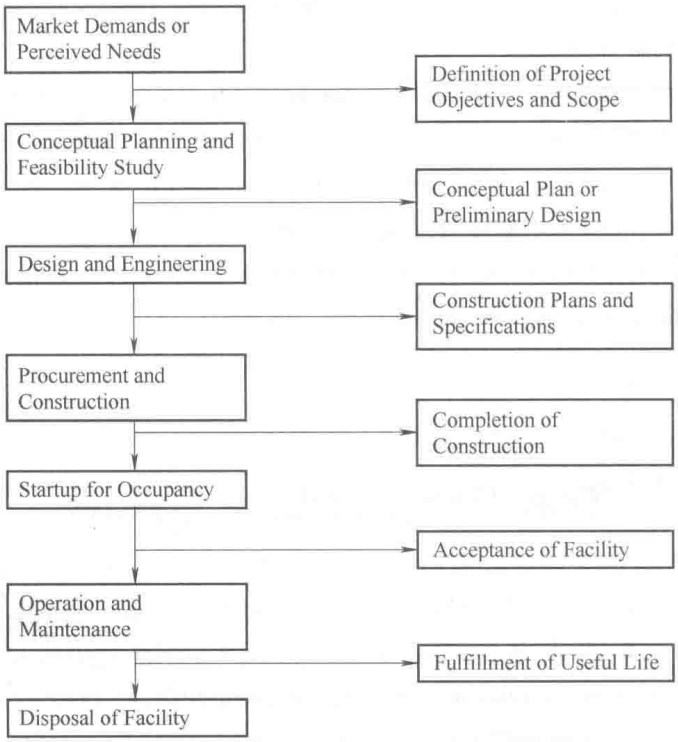

Figure 1-1 The Project Life Cycle for a Constructed Facility

the nature, size and urgency of the project. Furthermore, an owner may have **in-house** capacities to handle the work in every stage of the entire process, or it may seek professional advice and services for the work in all stages. Understandably, most owners choose to handle some of the work in-house and to contract outside professional services for other components of the work as needed. By examining **the project life cycle** from an owner's perspective we can focus on the proper roles of various activities and participants in all stages regardless of the contractual arrangements for different types of work.

In the United States, for example, the U. S. Army Corps of Engineers has in-house capabilities to deal with planning, budgeting, design, construction and operation of waterway and flood control structures. Other public agencies, such as state transportation departments, are also deeply involved in all phases of a construction project. In the private sector, many large firms such as DuPont, Exxon, and IBM are adequately staffed to carry out most activities for plant expansion. All these owners, both public and private, use outside agents to a greater or lesser degree when it becomes more advantageous to do so.

The project life cycle may be viewed as a process through which a project is implemented **from cradle to grave**. This process is often very complex; however, it can be decomposed into several stages as indicated by the general outline in Figure 1-1. The solutions at various stages are then integrated to obtain the final outcome. Although each stage requires different expertise, it usually includes both technical and managerial activities in the **knowledge domain** of the specialist. The owner may choose to decompose the entire process into more or less stages based on the size and nature of the project, and thus obtain the most efficient result in implementation. Very often, the owner retains direct control of work in the planning and programming stages, but increasingly outside planners and financial experts are used as consultants because of the complexities of projects. Since operation and maintenance of a facility will go on long after the completion and acceptance of a project, it is usually treated as a separate problem except in the consideration of the life

cycle cost of a facility. All stages may be broadly lumped together and referred to as the Design/Construct process, while the procurement and construction alone are traditionally regarded as the province of the construction industry.

Owners must recognize that there is no single best approach in organizing project management throughout a project's life cycle. All organizational approaches have advantages and disadvantages, depending on the knowledge of the owner in construction management as well as the type, size and location of the project. It is important for the owner to be aware of the approach which is most appropriate and beneficial for a particular project. In making choices, owners should be concerned with the life cycle costs of constructed facilities rather than simply the initial construction costs. Saving small amounts of money during construction may not be worthwhile if the result is much larger operating costs or not meeting the functional requirements for the new facility satisfactorily. Thus, owners must be very concerned with the quality of the finished product as well as the cost of construction itself. Since facility operation and maintenance is a part of the project life cycle, the owners' expectation to satisfy investment objectives during the project life cycle will require consideration of the cost of operation and maintenance. Therefore, the facility's operating management should also be considered as early as possible, just as the construction process should be kept in mind at the early stages of planning and programming.

New Words and Phrases

facility 设施，设备；容易，简易；灵巧，敏捷
feasibility 可行性；可能性
in-house 内部的，内业的
market demands 市场需求
the speculative housing market 投机性住宅市场
the real estate developer 房地产开发商
government agency 政府机构
public project 公共项目
project management 项目管理
the conceptual planning stage 概念规划阶段
the project life cycle 项目生命周期
from cradle to grave 从开始到结束
knowledge domain 知识领域

Passage B

Selection of Professional Services

When an owner decides to seek professional services for the design and construction of a facility, he is confronted with a broad variety of choices. The type of services selected depends to a large degree on the type of construction and the experience of the owner in dealing with various professionals in the previous projects undertaken by the firm. Generally, several common types of professional services may be engaged

either separately or in some combination by the owners.

Financial Planning Consultants

At the early stage of strategic planning for a capital project, an owner often seeks the services of financial planning consultants such as certified public accounting (CPA) firms to evaluate the economic and financial feasibility of the constructed facility, particularly with respect to various provisions of federal, state and local tax laws which may affect the investment decision. Investment banks may also be consulted on various options for financing the facility in order to analyze their long-term effects on the financial health of the owner organization.

Architectural and Engineering Firms

Traditionally, the owner engages an architectural and engineering (A/E) firm or consortium as technical consultant in developing a preliminary design. After the engineering design and financing arrangements for the project are completed, the owner will enter into a construction contract with a general contractor either through competitive bidding or negotiation. The general contractor will act as a constructor and/or a coordinator of a large number of subcontractors who perform various specialties for the completion of the project. The A/E firm completes the design and may also provide on site quality inspection during construction. Thus, the A/E firm acts as the prime professional on behalf of the owner and supervises the construction to insure satisfactory results. This practice is most common in building construction.

In the past two decades, this traditional approach has become less popular for a number of reasons, particularly for large scale projects. The A/E firms, which are engaged by the owner as the prime professionals for design and inspection, have become more isolated from the construction process. This has occurred because of pressures to reduce fees to A/E firms, the threat of litigation regarding construction defects, and lack of knowledge of new construction techniques on the part of architect and engineering professionals. Instead of preparing a construction plan along with the design, many A/E firms are no longer responsible for the details of construction nor do they provide periodic field inspection in many cases. As a matter of fact, such firms will place a prominent disclaimer of responsibilities on any shop drawings they may check, and they will often regard their representatives in the field as observers instead of inspectors. Thus, the A/E firm and the general contractor on a project often become antagonists who are looking after their own competing interests. As a result, even the **constructability** of some engineering designs may become an issue of contention. To carry this protective attitude to the extreme, the specifications prepared by an A/E firm for the general contractor often protects the interest of the A/E firm at the expense of the interests of the owner and the contractor.

In order to reduce the cost of construction, some owners introduce value engineering, which seeks to reduce the cost of construction by **soliciting** a second design that might cost less than the original design produced by the A/E firm. In practice, the second design is submitted by the contractor after receiving a construction contract at a stipulated sum, and the saving in cost resulting from the redesign is shared by the contractor and the owner. The contractor is able to absorb the cost of redesign from the profit in construction or to reduce the construction cost as a result of the redesign. If the owner had been willing to pay a higher fee