

# 建筑工程企业 科学管理

Analysis on Scientific Management  
of Construction Engineering  
Enterprise

○ 鲁贵卿 著  
Lu Guiqing

# 实论



湖南大学出版社

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## 内 容 简 介

本书是关于建筑工程企业科学管理的学术专著。全书分5章,涵盖了建筑工程企业科学管理的战略决策、市场经营、人力资源、工程项目、企业文化五大方面,从全局性、战略性的高度,提出了适合中国国情的建筑工程企业科学管理体系构建的思想、理念、原理和方法,构建了“中国式”建筑工程企业科学管理范式,对当代建筑企业管理实践具有较强的指导作用。

本书最大的特色是作者通过剖析中国建筑第五工程局有限公司改革发展的成功案例,总结了作者30多年从事大型国有建筑工程企业管理实践及理论的研究成果。

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## 建筑工程企业科学管理实论

JIANZHU GONGCHENG QIYE KEXUE GUANLI SHILUN

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# 序一

工程管理科学是一门工程技术科学与管理科学交叉的复合型学科，也是工程技术科学领域的重要分支。随着中国经济持续、稳定、快速发展，工程建设强劲发展的势头不减，工程管理科学越来越显现出重要的科学意义和实践价值。

改革开放、经济发展使我国建筑业得到空前的发展。伴随着我国基础设施的建设和大型工程的实施，中国建筑工程技术、工程质量和工程效益大幅度提升，同时建筑业已成为我国社会经济发展的重要支撑力量。

进入 21 世纪，国内建设事业持续发展，国际经济技术合作步伐加快，为中国建筑工程企业带来了新的发展机遇。

30 多年来，中国建筑业的发展成就令世界瞩目，中国建筑业的形象、品牌已获得国际建筑业界的高度认同，中国建筑已大步迈上国际建筑业舞台。与此同步，建筑工程科学管理也取得长足进展。

中国建筑工程总公司是全球最大的建筑房地产综合企业集团，位列世界 500 强的第 100 位。创建于 1965 年的中国建筑第五工程局（前身为 101 工程指挥部，简称中建五局）是中国建筑工程总公司的骨干企业，在房屋建筑施工、基础设施建设、房地产与投资三大建设领域形成了广阔的海内外市场，其竞争实力位居中国建筑业百强企业前 5 位，产值利润率水平在全国同行业中处于领先地位。

但人们可能很难想象，今日在业界享有盛誉的中建五局，也曾经走过一段曲折艰难的历程。就在十年前，中建五局还是一个连年亏损、一度濒临破产的困难国有企业。2001 年，国家审计报告称其“资不抵债，举步维艰，企业的部分职工只好自谋生路，甚至到附近菜场捡菜叶为生……”。2002 年，中国建筑工程总公司的审计报告记载：“该企业下属 16 家二级单位中有 11 家亏损，不良资产达 4.8 亿元，拖欠职工工资 2 亿多元，有的公司拖欠工资长达 48 个月……中

建五局是一个发展非常困难的企业，许多问题积重难返，需要作长期而艰苦的奋斗，无论谁来挑这副担子，都将面临巨大的挑战，都需要足够的勇气和足够的智慧。”

2002年12月，中国建筑工程总公司调任有着丰富管理实践经验的鲁贵卿同志为中建五局局长。十年间，在鲁贵卿同志的领导下，中建五局在建筑工程这个完全竞争性领域走出了一条从困境到新生、从弱小到强大、从“老国企”到“新国企”的发展之路，全局合同额从20多亿元增长到1000多亿元，营业额从20多亿元增长到500多亿元，利润总额从连年亏损到盈利20多亿元，分别增长了46倍、19倍、812倍，员工收入连续十年年均增长20%以上，实现了“持续发展、快速发展、加速发展、科学发展”，探索出了一条适合国情的、具有科学管理特色的国企发展之路，被业界称为“中建五局现象”。也是在这十年中，中建五局获得国家级建筑工程奖项96项、国家级企业奖项114项、省部级建筑工程奖项600多项，有400多人次获得国家级和省部级表彰。2012年12月，中建五局还荣获中国管理科学学会颁发的“管理科学奖”，成为该奖项设立以来唯一获得此殊荣的建筑工程企业。

中建五局以科学构建工程管理体系为基础，推动企业跨越式发展的实践，破解了“处于完全竞争性领域的困难老国企能不能搞好”的难题。换句话说，一个处于困境的老国有企业，为何能浴火重生，跨越发展，成为充满活力的现代化企业？其奥秘就在于建筑工程科学管理。

鲁贵卿以30多年大型国有建筑工程企业的实践探索为基础，潜心于建筑工程管理学研究。自2003年以来，他勇于探索、敢于实践、善于总结，从全局性、战略性的高度，提出了适合中国国情的建筑工程科学管理体系构建的思想、理念、原理和方法，构建了“中国式”建筑工程科学管理模式。尤其是他借鉴闻名于世的水利工程都江堰的治水智慧，创建了独具特色的“都江堰三角法则”，构建了以“人为本体”理念为基础的人力资源管理模型；他将马克思主义生产力理论与中华民族“天圆地方”的传统哲学理念有机结合，以过程控制与成本管控为核心内容，建立了建筑工程项目系统管理模型；他吸取中华文化、湖湘文化和“中建文化”的精髓，成功打造了支撑建筑工程企业科学管理的“信·和”主流文化。这些成

果将一个企业家卓越的经营智慧与一个学者严谨的学术逻辑有机结合起来，大道至简，揭示了工程管理规律，对行业理论和实践创新作出了积极的贡献。

基于国情的不同，中国工程科学管理体系构建的思想、机制与模式不同于欧美、日本等国家。因此，建立和不断完善具有中国特色的建筑工程施工管理体系是必须的，也是可行的。

以全球视野来看，中国建筑业进入国际建筑市场的同时，中国式建筑工程施工管理也应同步“登台”，挺胸跨入国际一流的建筑工程施工管理领域。

鲁贵卿教授集多年的实践探索与研究结果铸于一书，学术性与实践性兼备。该著作具有重要的理论意义和实践价值，是我国建筑工程施工科学管理领域的一项重要系统性成果，有很广泛的指导意义，为建筑企业的工程管理乃至整个工程施工管理界提供了学习、借鉴的范本。

这是一本关于建筑工程施工企业科学管理的学术专著，与其他工程管理学著作不同，其最大特色是建立在工程管理实践探索基础上的理论研究与总结，又被用于指导建筑工程施工管理实践，并取得巨大的社会效益和经济效益，使中建五局成为我国国有企业改革向纵深发展、不断适应市场经济发展规律的一个成功范例，还被全国 MBA 教育指导委员会选为“第三届百篇优秀管理案例”之一。中建五局的管理实践已经成为中国建筑工程企业科学管理的一个典范。

作者嘱余为序，欣然允之，并期望他在建筑工程施工管理科学领域继续前行，不懈探索，多出新的成果，为我国工程管理学的发展作出新的贡献。

何继善

2013 年 6 月

何继善，中国工程院院士，著名地球物理学家、工程管理学专家，教授，地球物理、工程管理学博士生导师，原中南工业大学校长，现任湖南省科学技术协会名誉主席。

# **preface 1**

Engineering management science is a kind of cross-disciplinary and complex science including engineering science and management science. It is also an important branch of engineering technology science. With sustainable, stable and rapid development of Chinese economic society, the momentum of engineering construction is on its bright way. Engineering management science increasingly reveals its scientific significance and practical value.

With reform and opening-up, as well as economic development, Chinese construction industry has confronted an unprecedented development. Along with construction of the infrastructure and the implementation of the large project in China, China construction engineering technology, engineering quality and engineering efficiency have been improved significantly, at the same time, the construction industry has become an important support of the social and economic development in China.

Entering the 21th century, the domestic construction business continues to develop, and international economic and technical cooperation between countries accelerate as well. Chinese construction engineering corporations confront new opportunity. The honorable achievement of Chinese construction for the part 30 years gains attention of the world. The international construction field has approved the image and brand of Chinese construction. At the same time, the scientific management of construction engineering has made progress.

China State Construction Engineering Corporation (CSCEC) is the largest construction and real estate conglomerate around the world, ranking the 100th in Fortune Global 500. The Fifth Bureau of China State Construction Engineering

Corporation (CSCEC 5b), taking the long lead of CSCEC's contracting business, is established in 1965 with the 101 engineering headquarters as its precursor. The corporation has formed wide market at home and abroad in 3 areas of housing construction, infrastructure construction, real estate and investment, its competitive ability ranks the first 5 among Chinese top 100 enterprises of construction industry, and its profit rate level of output value is also taking the leading position in the same industry of the country.

However, it may be too hard to imagine today, CSCEC 5b, possessing a high reputation in this field, has gone through a tortuous and difficult period before. 10 years ago, the state-owned corporation, once on the verge of bankruptcy, has been running at a heavy loss for years. In the national audit report of the year 2001, it recorded, " the corporation's assets are insufficient to cover liabilities, it runs toughly; part of the employees of the company have to fend for themselves with great difficulty, even to pick up the leaves around the vegetable market. . . " The records of the CSCEC's audit report indicated: " 11 of the 16 subordinate enterprises have been at a loss. The corporation's non-performing assets reach 4.8 hundred million yuan, and fall into arrears of wages with more than 2 hundred million yuan, some company has 48 months wage in arrears to be paid. . . The corporation is rather tough with many problems cumulative to be solved, it has to strive arduously for a long term. Anybody assuming the responsibility will need enough courage and wisdom to face enormous challenge. "

In December of 2002, the CSCEC dispatched Lu Guiqing with rich management and practical experience as the chairman of CSCEC 5b. Under the leadership of comrade Lu Guiqing for 10 years, the corporation has explored a brand new development road in the fully competitive field, from dilemma to revival, from weak to strong, from the " old enterprise " to " new enterprise " . The corporation's global contract amount increased from over 20 hundred million yuan to over 100 billion yuan, the turnover climbed from over 2 billion yuan to o-



ver 50 billion yuan, total amount of profit added from long-loss to profit of over 20 hundred million yuan, increasing respectively 46 times, 19 times, 812 times. Also employee income has been in average annual growth of above 20% for ten consecutive years. The corporation achieves " sustainable development, rapid development, accelerated development, scientific development", and explores a developing road suitable for national conditions of a state-owned enterprise with scientific management characteristic. It is known as " the CSCEC 5b Phenomenon". In these ten years, the corporation has attained 96 national construction engineering awards, 114 national enterprises awards, over 600 provincial construction engineering awards. Up to now, more than 400 people received national and provincial and ministerial awards. In December of 2012, the corporation also won award of management science issued by China Institute of Management Science, and it was the only one construction enterprise winning the title since the award was established.

CSCEC 5b, based on scientific construction engineering management system, promotes corporation development by leaps and bounds. This practice resolves the problem " whether old state-owned enterprises could operate successfully in a fully competitive field " . In other words, how could a struggling old state-owned corporation revive and leapfrog into a modern enterprise filled with vitality? The secret lies in the construction project's scientific management.

As for 30 years of practical experience in enormous state-owned construction enterprises, Lu Guiqing is concentrating on his research of the construction engineering management. Since 2003, he has formulated strategically and completely viewpoints, principles and methods suitable for the Chinese construction situation of construction engineering scientific management, after exploration, practice and summary; and formed the " Chinese style" mode of construction engineering scientific management. Especially he learned from the wisdom of water control in the world famous hydraulic project of Du jiangyan, and then created

characteristic " Dujiangyan Triangle Rule"; built a human resource management model based on "people-oriented" concept; he has combined organically productive forces of Marx theory and traditional philosophical concepts, with the progress control and cost control as its core content, to establish construction engineering project management model; absorbed the essence of Chinese culture, Huxiang culture and the CSCECE culture, created " Faith and Harmony" mainstream culture supporting scientific management of construction engineering enterprises. These achievements, indicate organic combination of excellent operation wisdom of a entrepreneur and rigorous academic logic of a scholar, reveal the rule of project management, and make positive contributions to the industry theory and practice innovation.

Based on the different national conditions, the concept, mechanism and mode of Chinese projects' scientific management system are different to Europe, the United States, Japan and other countries. Therefore, establishing and improving the construction project management system with Chinese characteristics is necessary, and is also feasible.

Globally thinking, Chinese construction business is entering international construction market, Chinese construction engineering management shall enter the "arena", then step into world first-class construction engineering management field.

Professor Lu Guiqing collects over 30 years' practical and research achievements in a book with academic and practical characteristics, possessing significant theoretical and practical value. This is a systematically significant achievement with extensive guiding significance, providing learning template for the engineering management of construction enterprise, even the engineering management field.

This is a book of academic monograph about the scientific management of construction enterprises. Unlike other academic monographs of engineering man-

agement, its most notable characteristic, which is its theoretical research and summary, based on the exploration of engineering management practice, will guide the practice of construction engineering management, and thus achieving great economic and social benefits. It makes the corporation a successful example of Chinese state-owned enterprises' reform and constant adaption to the law of development of market economy. It is also selected as "The 3rd session 100 excellent management case" by the national MBA Education Steering Committee. The corporation's management practice has become a typical learning model of scientific management of Chinese construction engineering enterprises.

I feel glad that the author invited me to write a preface and I made a promise. I expect him to continue moving forward in the construction engineering management science field with more explorations, and anticipate new achievements and new contribution to the development of Chinese engineering management science.

**He Jishan**

**June, 2013**

He Jishan, academician of the Chinese Academy of engineering; famous geophysicist, experts of engineering management; professor, doctoral tutor of geophysics, engineering management disciplines; former president of Central South University of technology, Hunan Province; honorary chairman of Hunan scientific Committee.

## 序二

据本人所闻所知，1965年创建于贵州省遵义市的中国建筑第五工程局在随后的一段时间里，乃是装备精良、极具特色、善打硬仗、遐迩闻名，特别是在中国西南山区建设中立下了汗马功劳的一支“铁军”。随后中国实行改革开放政策，特别是与整个中国经济以万马奔腾之势的发展相比，中建五局跌宕起伏的走向与变化，确实令人十分难过和非常揪心。直至最近十年来，中建五局又一次走上了奇迹般的变化与发展之路，令我十分欣喜和感到意外，同时印到我脑海中的一个人物，就是中建五局董事长鲁贵卿同志，但我只闻其名，却未有机会谋面。以我本人的职业志趣和探索习性，我确实很有兴趣想看看发生了巨变的中建五局，并与其董事长好好聊聊。

2010年4月，我终于有机会访问考察了中建五局。我一抵达五局大厦就感受到了五局特别浓厚的人文文化气氛，人们接待做事干净利索，很讲究效率，给人第一印象是这个单位“精、气、神”很足。随后，鲁贵卿董事长将五局的情况向我做了详细且十分精彩的介绍，我感慨颇深，受益良多，当时我凭自己的直觉感受，为五局留下了八个字——“科学创新、精细高效”，现在想来应当是“科学、诚信、精细、高效”，也许这样更能充分表达本人的原意。三年过去了，鲁董事长已把他30年建筑工程和建筑工程企业管理的思考与实践写成了这本书，他邀请我为此书写个序，我欣然应允，而且感到十分荣幸。

首先，鲁贵卿同志在中建五局濒临倒闭的时候，临危受命，力挽狂澜，这本身就说明他拥有极大的勇气与智慧去迎接这项严重的挑战。当时的2001年、2002年，中建五局是一个“资不抵债，举步维艰”的困难国企，有的职工工资被拖欠达48个月之久，全局笼罩着一片悲观失望的气氛，许多问题积重难返，需要作长期的努力奋斗才能有所改变。就在这之后的十余年时间里，中建五局

逐步发生了改变,呈现在我们面前的是规模效益指标的 85°增长曲线。2012 年,中建五局实现合同额 1000 多亿元,创利税 40 多亿元,这两项指标分别比 2002 年增长了 46 倍、812 倍,年均增速分别达到 47%和 108%,效益增长幅度远远超过规模增长幅度;相应的人才队伍建设,也呈显 V 形变化。当然中建五局与其他企业和社会成员一样,都受益于全社会快速发展的机遇和红利,但企业带头人的正确领导和极具号召力及其在工程管理和企业管理中所表现出来的创新性与科学精神,无疑是非常关键的因素。

其次,我认为本书所总结的内容,可以说是目前我国建筑工程项目管理模式的升级版。我国建筑工程管理经历了计划经济模式、“项目法施工”承包制模式、“项目法施工”项目经理负责制模式、“项目法施工”项目经理责任制模式,而这本书阐述的是建立在“工程项目目标管理三圆图”、“工程项目成本管理方圆图”等理论和实践基础上的“项目法施工”以项目经理为主要责任人的全员责任模式,即以“工程项目成本管理方圆图”精细管理为工具和以工期质量好、成本效益好、安全环保好、资金管控好、团队建设好、项目信誉好“六好”与业主满意、企业满意、社会满意、分供方满意、员工满意、相关方满意“六满意”为项目管理目标的全员责任模式。建筑行业发展到今天,必须进行管理模式创新,否则建筑行业科学技术的发展、工程项目管理水平的提高、建筑工程企业国际竞争力的提升将受到制约。所有这些都经过作者的实践检验,对旧有工程项目管理模式创新是本书的显著特色。

第三,本书称得上是建筑工程师的良师益友。建筑业的发展快慢、建筑工程管理水平的高低取决于为工程服务的工程师队伍的能力和水平高低。工程师的能力和水平是从工作实践中锤炼出来的,工程师也少不了新知识的培训和职业成长通道的畅通。鲁贵卿创造了“都江堰三角法则”,并利用这个法则,提出了“七成定律”,建立“四三五薪酬体系”,设立了工程专业技术和工勤技师职业成长序列通道,使一部分人在职业成长中安心地、持续不断地从事一种职业,这样不论对工程师个人还是对企业来说都是划得来的、值得的。建筑工程企业中工程师队伍是基础,是中坚力量,必须善待、善用之。

这本书值得称道的地方还有很多,读者可以从中各取所需,举一反三地琢

磨运用或从中得到有益的启示。

本人特别钦佩作者的敬业勤业精神及其执着实践求索的志趣。作者不仅为广大读者提供了如此丰厚的技术成果，也为我们治学做事树立了值得学习的榜样。赞叹之余，特为之序！

许溶烈

2013年6月于北京

许溶烈，浙江绍兴人，原建设部党组成员，原建设部总工程师，科技委副主任、顾问；曾任中国土木工程学会理事长、中国建设机械协会理事长、中国建筑学会副理事长；清华大学、同济大学兼职教授，西安建筑科技大学教授、研究生导师；瑞典皇家工程科学院外籍院士、英国皇家建造师学会荣誉资深会员、英国土木工程学会资深会员、香港工程师学会资深会员等；获中国突出贡献专家称号，获享受国务院特殊津贴专家待遇，获美国普立顿大学荣誉理学博士学位。

## preface 2

The Fifth Bureau of China State Construction Engineering Corporation founded in 1965 in Zun yi, as far as I know; the team in the subsequent time is unique, well equipped, and well known for making enormous contribution as " Iron Army" especially in construction progress of southwest China. With reform and opening-up policy, it is indeed very embarrassing for the corporation for its ups and downs especially compared to fast development of Chinese economy. For the past ten years, I felt very surprised and pleased to the corporation's miraculous development. I wanted to know how the president had changed the company. Based on my own interests and habits, I was very glad to see the brand-new company, and to have a chat with Lu Guiqing.

In April, 2010, I finally had a chance to visit CSCEC 5b. I felt the profound cultural atmosphere when arriving the company, and also the high efficiency of work, that was my first impression. The president Lu Guiqing subsequently presented me the conditions of corporation in detailed and wonderful introduction. I benefited a lot, then I gave them the following words: " Scientific innovation, high efficiency. " Actually, these words should be " science, faith, precision and efficiency" . Three years later, Mr. Lu sent me a book. In this book, there is his 30 years' concept and experience of construction project and its management. And I feel honored to do it when he invited me to write a preface.

Firstly, it needs great courage and wisdom to accept this difficult challenge of leading the corporation at the brink of collapse. In the year of 2001 and 2002, CSCEC 5b was a difficult company which " failed to repay debts, struggled to run", even some workers were owed wages 48 months later. An atmosphere of

pessimism enveloped over the CSCEC 5b, The corporation was rather tough with many problems cumulative to be solved, it had to strive arduously for a long term. In the past ten years, the company has changed dramatically. Now, the corporation has presented us economies of scale through 85 degree curve, in 2012 the operation scale amounted to 100 billion yuan, profits and taxes amounted to 4 billion yuan, these two indexes have increased by 46 times and 812 times as against 2002 with respectively annual growth of 47% and 108%; profit growth rate far exceeded the growth scale; presented a V type map of employee team formation. Undoubtedly, the president's leadership, and innovative and scientific spirit of enterprise leader in engineering management and corporation management are very important.

Secondly, the content this book summarized upgrades the mode of Chinese construction engineering project management. The construction engineering management in our country has gone through four periods: the mode of planned economy, "manager's fixed expenses under project method construction" "project manager fully-authorized system under project method construction" "project manager partly-authorized system under project method construction" . This book elaborates all staff responsibility system. It is based on theory and practice of " three circle diagram of engineering project objective management" " square-circle map of engineering project cost management" . It includes meticulous tool management of "square-circle map of engineering project cost management" and "Six satisfactory objectives" —— "deadline and quality satisfy client, cost and effectiveness satisfy corporation, safety and environmental measures satisfy society, finance and control satisfy supplier, team spirit and cooperation satisfy employee, project reputation satisfies other parties" . Nowadays, the innovation of the management mode should be propitious to the development of science and technology in construction industry, the improvement of project management level, the promotion of construction enterprises' international competitiveness



will be restricted. All those are effective and have been tested by practice.

Thirdly, the book could be both friends and teacher to engineers. The development pace of construction and the level of construction project management depend on the level of engineers. Engineer stands out with new knowledge training and smooth career in the real work. Professor Lu Guiqing created a " Dujiangyan Triangle Rule", put forward the " Seventy percentage Rule" , build "435" wage system, and set up growth sequence channel for engineers and technicians, under these policies part of employees could focus on his field all the time. It is worthwhile for both enterprise and engineers themselves. Therefore the corporation should give good treatment to engineers for they are not the foundation, but also the group with largest number.

There are so many aspects to commend, each reader could get what they need from this book. They can use it or benefit from it.

I admire the author's dedication and his persistence in practice and exploration.

The author not only provides such lucrative technological achievements for readers, but also sets an example for our work. The preface is hereby given.

**Xu Ronglie**

**June, 2013**

Xu Ronglie, Who was born in Shaoxing, Zhejiang, has been chief engineer of Construction Ministry, consultant and deputy director of Construction Science and Technology Committee; has been former chairman of the Chinese Civil Engineering Association, deputy director of Architectural Society of China; has been adjunct professor of Tsinghua University and Tongji University, professor and postgraduate tutor of Xian University of Architecture and Technology; has been foreign academician of the Royal Swedish Academy of Engineering Sciences, honorable fellow of Royal Institute of British Architects, fellow of The Institution of Civil Engineers and the Hong Kong Institution of Engineers; has received the title of expert of outstanding contribution, enjoyed special allowances of State Council.