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Study on the Implementation Path of Management by Objectives in the Progress of Foreign Government Loan Projects

—A Case Study of FF Company's Heating Project

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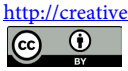

Abstract

Aiming at the problems of long cycle and limited expected effects of foreign government loan projects, this paper focuses on schedule management, based on Drucker's Management by Objectives (MBO) theory, and takes the sewage source heat pump heating project of FF Company as a case to construct a full-process management framework of "target task decomposition, responsible subject division, construction period assessment setting, process deviation regulation". By establishing the Work Breakdown Structure (WBS) to clarify target tasks, refining the power and responsibility boundaries of each subject, scientifically calculating a reasonable construction period, implementing strict performance assessment management, and supporting the whole-process dynamic monitoring and deviation adjustment, it strives to shorten the overall project cycle, improve the utilization efficiency of foreign government loans and the implementation effect of the project, and provide theoretical support and practical reference for the schedule control of similar projects.

Keywords

Management by Objectives (MBO), Foreign Government Loan Projects, Project Progress Management, Work Breakdown Structure (WBS), PERT Duration Estimation

1. Introduction

1.1. Research Background

Since China's reform and opening-up, introducing foreign capital has been a key

driver of domestic economic development, and foreign government loans have emerged as a major form of foreign capital utilization. These loans have significantly supported infrastructure construction and industrial upgrading. However, practical challenges persist in progress management: project owners often lack sufficient attention to systematic progress control, leading to lengthy cycles from loan application to project operation. This not only delays the realization of project benefits but also increases operational risks.

1.2. Research Gap and Purpose

Existing studies on foreign government loan projects mainly focus on policy analysis and financial risk control, with limited empirical research on progress management using systematic management theories. Management by Objectives (MBO), as a mature management method integrating goal-setting, responsibility allocation, and performance appraisal, has been widely applied in corporate management but rarely in the specific context of foreign government loan projects.

This study aims to fill this gap by exploring the application of MBO in progress management of foreign government loan projects. Taking FF Company's heating project as a case, it constructs a practical implementation path to ensure projects are completed within the ideal cycle and exert maximum effectiveness.

1.3. Research Significance

Theoretically, this study enriches the application scenarios of MBO theory in public-private cooperative projects. Practically, it provides actionable guidelines for project owners, government departments, and cooperative entities to optimize progress management, shorten project cycles, and improve the efficiency of foreign capital utilization.

2. Theoretical Foundation: Management by Objectives (MBO)

2.1. Core Connotation of MBO

Management by Objectives (MBO), first proposed by Peter Drucker in his 1954 work The Practice of Management, stands as one of the most influential management philosophies. It refers to a management system or approach where managers and subordinates, guided by shared goals, adopt a result-oriented mindset, prioritize self-control, and feature process-based motivation. Its core logic follows a sequence: goal setting, responsibility assumption, self-control, achievement of expected outcomes (Ji & Zhao, 2021). In the 1970s, following the widespread adoption of Management by Objectives (MBO) in enterprises (Lin, 2013), it emphasizes the "unification of powers, responsibilities, and interests" and "whole-process control", and is a management mode and technology implemented to maximize corporate profits.

Drucker argued that the true meaning of management lies in setting goals—goals that determine what kind of work managers should do, what standards that

work should meet, and how to achieve those standards. In essence, management takes goals as its core and is defined as a practice centered on goal-oriented decision-making (Li, 2006).

Management by Objectives (MBO) divides the management process into three phases: goal setting, goal implementation, and goal evaluation (Yao, 2017). After the completion of goal implementation, performance appraisal is used to measure the degree of achievement of individual goals. Performance appraisal is an important means to supervise goal implementation and a key tool for risk control and mitigation. Only through the close integration of goal-setting and performance appraisal can management synergy be formed. In the Management by Objectives (MBO) system, every individual can evaluate their own performance by comparing actual results with set goals, so as to proactively improve their work, this embodies the principle of self-control (Qiu & Wang, 2013).

MBO emphasizes process management. Its core philosophy is: attaching equal importance to outcomes and processes (Wu & Li, 2008). Based on the established goals, the organization continuously measures and monitors the progress of work and performance, and constantly improves management methods to maximize organizational performance. MBO practitioners must track the entire process, grasp the progress of each goal, collect and feed back performance management data to team members. After members obtain the information needed to measure their performance, they make necessary adjustments according to the results they intend to achieve.

2.2. Compatibility of MBO with Foreign Government Loan Project Progress Management

Progress management of foreign government loan projects is essentially a type of project management, belonging to the internal management scope of project demanders. MBO, originally developed to maximize corporate profits, aligns with the core needs of project progress management—standardizing processes, clarifying responsibilities, and improving efficiency. Its emphasis on process monitoring and performance appraisal also addresses the pain points of prolonged cycles and unclear accountability in foreign government loan projects. Therefore, it is evident that applying the MBO theory to study the schedule management of foreign government loan projects has an inherent compatibility.

3. Research Design and Methodology

3.1. Case Selection

FF Company's sewage source heat pump heating project is selected as the research case. The project relies on foreign government loans for funding, covering four key phases: project approval and initiation, bidding and procurement, supply and installation, and completion acceptance. It is representative of foreign government loan projects due to its complex approval procedures, multiple participating entities, and strict time constraints.

3.2. Research Methods

- **Case study method**: Deeply analyze the application of MBO in FF Company's project, collecting first-hand data through interviews and project documents.
- **Work Breakdown Structure (WBS)**: Decompose the project into hierarchical tasks to clarify task sequences and dependencies.
- **PERT three-time estimation method**: Calculate the ideal duration of each task based on operational experience from 10 similar projects and FF Company's practical data.
- **Responsibility division matrix**: Define responsible entities for each task to avoid buck-passing and ensure accountability.

3.3. Data Sources

Data are collected from the following sources:

1) Project documents of FF Company (e.g., feasibility study reports, bidding documents, and progress records).

2) Interviews with project managers from FF Company, government departments, and cooperative entities.

3) Interviewed three experts. The first is Senior Project Manager Mr. G from an office of Agence Française de Développement (AFD). He provided suggestions on the WBS decomposition of the schedule for FF Company's sewage source heat pump heating project funded by AFD loans. Additionally, from the lender's perspective, his recommendations for accelerating the progress of foreign government loan projects are of significant reference value. The second is Professor L, an expert from BV International Consulting, a firm cooperating with AFD. With years of experience at BV International Consulting, Professor L possesses rich practical and theoretical expertise in large-scale project management. He has participated in the project evaluation of almost all energy projects funded by AFD loans, with a deep understanding of the impact intensity of numerous factors affecting project progress, and has put forward many constructive suggestions for the project schedule management discussed in this paper. The third is General Manager Mr. J from the Bidding and Procurement Department of China National Machinery Import and Export (Group) Corporation (CMEC). Mr. J has nearly 20 years of experience in bidding agency work and is highly proficient in the bidding and procurement agency services for common domestic government procurement projects, competitive negotiation projects, and international competitive bidding (ICB) projects applicable to foreign government loan projects. Furthermore, due to the unique role of bidding agency companies, they must closely follow the project progress of the owner during the project implementation process, continuously optimize the bidding plan, and conduct process control for key links. Based on this role positioning and his personal experience with the policies, development, and changes of foreign government loan projects, Mr. J has provided reliable practical experience for the schedule management of such projects.

4) Collected opinions on the project progress process from a total of 12 employ-

ees of FF Company, including those from the Project Department, Business Execution Department, Finance Department, and Legal Department, who were involved in different work stages of the project (both before and after project participation). These diverse viewpoints were summarized and generalized to form the basic content of this study.

5) FF Company's Project Cycle PERT Estimation. Due to the complex operational processes of foreign government loan projects and the absence of unified standard progress regulations for each project activity, it was decided to adopt the three-time estimation method in Program Evaluation and Review Technique (PERT) to estimate the expected duration of each activity in the Work Breakdown Structure (WBS) of FF Company's project. This decision is based on the operational experience of three experts in dozens of Agence Française de Développement (AFD) projects obtained through in-depth expert interviews, combined with the first-hand experience of FF Company's project team. After calculation, the project duration T and variance σ^2 of FF Company's project are as follows: $T = \sum t_i = 801$ working days, $\sigma^2 = 183$, and the standard deviation $\sigma = 14$ working days. According to the basic principles of the normal distribution: Within 1 standard deviation of the expected total duration (i.e., 787 to 815 working days), the probability of project completion is 68%. Within 2 standard deviations (i.e., 773 to 829 working days), the probability of project completion is 95%. Within 3 standard deviations (i.e., 759 to 843 working days), the probability of project completion is 99%. It has been verified that the calculated duration is basically consistent with the roughly formulated project schedule by FF Company at the initial stage of the project's actual implementation.

4. Case Analysis: MBO Implementation in FF Company's Heating Project

4.1. Phase 1: Defining Target Tasks for Project Progress Management—Establishing WBS

The first step of Management by Objectives (MBO) is goal setting (Wang, 2004). Foreign government loan projects have the characteristics of multiple stages, complicated tasks and strong connection, so the abstract project overall objectives should be transformed into concrete and decomposable task system. A project schedule plan is a process in which the project organization formulates a detailed arrangement for the sequence and required time of the overall project implementation work by decomposing the predetermined overall goal into several subgoals. It is a work plan that specifies the specific tasks in the project, the start and completion times of the tasks, the sequence of task implementation, and the connection relationships between tasks, thereby integrating all work tasks of the overall project into a coordinated and organic whole. Among these elements, project tasks and their connection relationships are the premise and foundation for formulating a project schedule plan. Only with clear tasks can targeted management be carried out.

Take FF Company's sewage source heat pump heating project as an example. According to the time-based progress, the project can be divided into four phases: approval and project initiation, tendering and procurement, supply and installation, and completion acceptance. Table 1 presents these four phases of FF Company's heating project, and in accordance with the overall requirements of each phase, decomposes them into several sub-projects in sequence—i.e., the specific work tasks corresponding to each process phase. On this basis, Table 2 further clarifies the precedence relationships between each sub-project, thereby forming a work breakdown structure (WBS) diagram. This serves as the foundation for scientifically and rationally formulating the project schedule and conducting timely project progress control.

Table 1. Work breakdown of FF company's heating project.

Project Approval	Tender Procurement	Supply and Installation	Completion
1. Select a design institute—Determine the design and design requirements	1. Prepare bidding documents—Prepare technical bidding documents, prepare commercial bidding documents, form review drafts and translate them, submit for approval, and foreign institutions issue	1. Start-up preparation—Determine the supply and installation batches, determine the supervision unit, civil engineering handover, prepare completion drawings, complete the preparation of construction organization design and submit for	1. Audit and liquidation—Equipment supply liquidation, construction project liquidation, completion data preparation and submission, EIA testing and evaluation
2. Prepare feasibility report and approval—Provide original materials for preparing the report, complete the first draft of the report, form a feasibility report, translate the review draft, submit to the consulting company and foreign development agencies, the lender puts forward a research report questionnaire, reply to the questionnaire and improve the research report, on-site evaluation and sign a memorandum, approval by foreign institutions, report to the National Development and Reform Commission and the Department of Finance, expert review, and formal approval of the research report	2. Tenders—Issue on the net, prepare for bidding, open and evaluate bids, foreign institutions issue comment letters, announce the bid-winning results and issue bid-winning notices	2. Supply and installation—Equipment supply, technical safety disclosure, equipment hoisting into the site, installation and construction, apply for project progress payment	2. On-site completion acceptance—On-site acceptance, energy station renovation, sign completion acceptance report
3. Select a tender agency	3. Signing and entry into force of the bid-winning contract—Negotiation and signing, issue advance payment guarantee and performance guarantee, contract entry into force	3. Commissioning and training	3. Acceptance and payment application—Issue quality guarantee, apply for project acceptance payment
4. Select fund application report and approval—Prepare fund application report,			

the owner puts forward modification opinions, determine the review draft, submit the fund application report for approval, and the application report is formally approved	
5. Sign loan agreement and sub-loan agreement	

Table 1 presents the four key phases of the overall implementation of FF Company's heating project, along with the main tasks corresponding to each phase.

Table 2. Work breakdown structure of FF company's heat supply project.

Task Code	Task Name	Predecessor Task	Task Code	Task Name	Predecessor Task
1	Project Initiation and Approval Phase	—	3	Supply and Installation Phase	—
1.1	Select Design Institute	—	3.1	Preparatory Work for Construction	—
1.1.1	Select Design Institute	—	3.1.1	Advance Payment for Construction	2.3.3
1.1.2	Determine Design Requirements	—	3.1.2	Determine Batches of Supply and Installation	2.3.3
1.2	Prepare Feasibility Report and Approval	—	3.1.3	Determine Supervision Unit	2.3.3
1.2.1	Provide Original Data	1.1.1, 1.1.2	3.1.4	Handover of Soil Foundation	2.3.3
1.2.2	Complete First Draft	1.2.1	3.1.5	Prepare Construction Drawings	3.1.4
1.2.3	Revise Report to Form Approval Draft	1.2.2	3.1.6	Complete Construction Organization Design and Submit for Approval	3.1.5, 3.1.3
1.2.4	Translate Feasibility Study Report	1.2.3	3.2	Supply and Installation	—
1.2.5	Submit to Consulting Company and Foreign Institutions	1.2.4	3.2.1	Equipment Supply	3.1.1, 3.1.2, 3.1.3
1.2.6	Lender Issues Questionnaire	1.2.5	3.2.2	Technical and Safety Disclosure	3.1.6
1.2.7	Reply to Questionnaire and Improve Report	1.2.6	3.2.3	Equipment Hoisting and Entry	3.2.2, 3.2.1
1.2.8	On-site Evaluation and Signing of Minutes	1.2.7	3.2.4	Installation and Construction	3.2.3
1.2.9	Approval by Foreign Institutions	1.2.8	3.2.5	Request Project Progress Payment	3.2.4
1.2.10	Submit to Provincial Development and Reform Commission and Finance Department	1.2.9	3.3	Commissioning and Training	—
1.2.11	Expert Review	1.2.10	3.3.1	Flushing and Pressure Test of Process Equipment	3.2.5
1.2.12	Official Approval of Special Review	1.2.11	3.3.2	Power-on Debugging of Electrical Equipment	3.2.5
1.3	Select Tendering Agency	—	3.3.3	Joint Commissioning and Debugging of Energy Station	3.3.2
1.4	Preparation and Approval of Fund Application Report	—	3.3.4	Training Services	3.3.3
1.4.1	Prepare Fund Application Report	1.2.12	4	Completion Acceptance Phase	—

Continued

1.4.2	Solicit Opinions from Industry Department on Fund Application	1.4.1	4.1	Review and Verification	—
1.4.3	Determine Approval Draft of Fund Application Report	1.4.2	4.1.1	Equipment Supply Verification	3.3.4
1.4.4	Submit Fund Application Report for Approval	1.4.3	4.1.2	Construction Work Quantity Verification	3.3.4
1.4.5	Official Approval of Fund Application Report	1.4.4	4.1.3	Prepare and Submit Final Acceptance Data	3.3.4
1.5	Sign Project Loan Agreement and Transfer Agreement	1.4.5	4.1.4	Environmental Assessment and Testing	4.1.3
2	Bidding and Procurement Phase	—	4.2	Pre-acceptance	—
2.1	Prepare Tender Documents	—	4.2.1	On-site Acceptance	4.1.1, 4.1.2, 4.1.4
2.1.1	Prepare Technical Tender Documents	1.4.5	4.2.2	Rectification of Energy Station	4.2.1
2.1.2	Prepare Commercial Tender Documents	1.3, 1.4.5	4.2.3	Sign Completion Acceptance Report	4.2.2
2.1.3	Review and Translate Tender Documents Draft	2.1.1, 2.1.2	4.3	Acceptance and Payment Request	—
2.1.4	Review Tender Documents	2.1.3	4.3.1	Open Performance Bond	4.2.3
2.1.5	Foreign Institutions Issue No Objection Letter to Tender Documents	2.1.4, 1.5	4.3.2	Request Project Acceptance Payment	4.3.1
2.2	Bidding Phase	—			
2.2.1	Online Listing	2.1.5			
2.2.2	Bidding Preparation	2.2.1			
2.2.3	Bid Opening and Evaluation	2.2.2			
2.2.4	Foreign Institutions Issue No Objection Letter to Bid Evaluation Results	2.2.3			
2.2.5	Publish Results and Issue Notification Letter	2.2.4			
2.3	Signing and Entry into Force of Winning Contract	—			
2.3.1	Negotiation and Signing of Winning Contract	2.2.5			
2.3.2	Open Advance Payment Bond and Performance Bond	2.3.1			
2.3.3	Winning Contract Enters into Force	2.3.2			

Table 2 presents the precedence relationships between each specific task during the advancement of FF Company's heating project.

4.2. Phase 2: Division of Responsibilities—Clarifying the Main Entities for Project Schedule Management

The project content structure breakdown formed by Table 1 and Table 2 only clarifies the specific work and content required to complete the project, as well as the precedence relationships between various tasks. The core reliance for the final

promotion and completion of a project lies in "people". Management by Objectives (MBO) seeks to integrate organizational goals and individual goals more closely, thereby enhancing employees' job satisfaction. This has played a positive role in motivating employees' enthusiasm and strengthening organizational cohesion. (Hu, 2013) The exertion of people's subjective initiative is a key factor in ensuring that the project schedule plan is realized as scheduled. Evidently, how to manage the specific "people" responsible for project implementation is crucial to the realization of the project schedule plan. For the management of "people", the method of management by objectives can be introduced.

Specifically, in the schedule management of foreign government loan projects, after the overall project objectives are determined, they must be effectively decomposed and transformed into sub-objectives of various departments and individuals. Managers shall assess, evaluate, and provide rewards or punishments to the responsible entities based on the completion of the sub-objectives. Since the objectives at all levels are based on the overall organizational objectives, when individual objectives are achieved, the organizational objectives will also be realized accordingly.

To achieve the established objectives, it is necessary to clarify which departments need to cooperate and what responsibilities each employee should undertake in their respective positions. This determines that to achieve the objectives, a job responsibility list is essential. Moreover, it must be clearly defined what tasks the superiors should undertake and what responsibilities the subordinates should bear to achieve the project objectives.

Due to the clear definition of responsibilities and smooth connection between work links, mutual buck-passing and evasion of responsibilities can be avoided, ensuring that the work between departments, between individuals, and between individuals and departments proceeds in a seamless and orderly manner. As mentioned above, we have conducted a comprehensive breakdown of the project tasks. The next step is obviously to clarify the responsible departments and responsible persons corresponding to each task. Only after strengthening responsibility implementation can the project promotion have real implementing entities.

It is particularly important to note that a department or an individual employee within an organization should not be assigned work that is beyond their capabilities or that they have no time to attend to. This is to prevent the waste of energy and resources on activities that generate no benefits, which in turn would affect the implementation efficiency and effectiveness of the project schedule.

The reason is that an important assumption of management by objectives is that objective standards and objectives are set for subordinate departments and employees, and these objectives are to be achieved through their own enthusiasm and continuous efforts in self-discipline and self-governance, replacing authoritarian management with self-control management. Achieving objectives then becomes a conscious requirement for every individual; everyone will use the objectives to guide their own actions and rely on their own efforts to ensure the achieve-

ment of the objectives. The "control" in self-control refers to the ability to guide oneself and direct one's own work, rather than being dominated by another person (He et al., 2020).

This requires employees to maintain a certain degree of control over the means to achieve the objectives. Each employee must be able to independently decide what they should do. Only when an employee has access to all relevant operational information pertaining to their work can they be fully responsible for the results.

Therefore, in the task breakdown of foreign government loan projects, the department and responsible person corresponding to each task must be clearly defined. Moreover, the tasks assigned to them should fall within their scope of responsibilities and must not go beyond their designated duties.

Following the logic of the management by objectives (MBO) theory, Table 3 clearly identifies the specific responsible entities for each task by combining the task breakdown of FF Company's heating project with the scope of responsibilities of relevant entities, so as to ensure that these responsible entities are held accountable.

Table 3. Division of responsibilities among entities for FF company's heat supply project.

Task Code	Task Name	Responsible Entity (ies)	Task Code	Task Name	Responsible Entity (ies)
1	Project Initiation and Approval Phase		3	Supply and Installation Phase	
1.1	Select Design Institute		3.1	Pre-construction Preparation	
1.1.1	Select Design Institute	FF Company, Design Institute	3.1.1	Request for Advance Payment	** Company, FF Company, Municipal Finance Bureau, Provincial Finance Department, ** Export-Import Bank, Bidding and Procurement Division of ** Machinery Import and Export (Group) Co., Ltd.
1.1.2	Determine Design Requirements	FF Company	3.1.2	Determine Batches of Supply and Installation	** Company, FF Company
1.2	Prepare and Approve Feasibility Report	FF Company	3.1.3	Determine Supervision Unit	FF Company, * Municipal Urban Construction Supervision Co., Ltd.
1.2.1	Provide Original Data	Design Institute	3.1.4	Handover of Civil Engineering Foundation	** Real Estate, FF Company
1.2.2	Complete First Draft	FF Company, Design Institute	3.1.5	Prepare Construction Drawings	Design Institute
1.2.3	Revise Feasibility Report into Submission Draft	Design Institute	3.1.6	Complete Construction Organization Design and Submit for Approval	** Company, FF Company, * Municipal Urban Construction Supervision Co., Ltd.
1.2.4	Translate Feasibility Study Report	FF Company	3.2	Supply and Installation	
1.2.5	Submit to Consulting	Consulting Company,	3.2.1	Equipment Supply	** Company, * Municipal Urban

	Company and Foreign Institutions	Foreign Institutions			Construction Supervision Co., Ltd.
1.2.6	Lender Issues Questionnaire	FF Company, Design Institute	3.2.2	Technical and Safety Disclosure	FF Company, * Municipal Urban Construction Supervision Co., Ltd., Design Institute, ** Company
1.2.7	Reply to Questionnaire and Improve Feasibility Study Report	Foreign Institutions, Consulting Company, FF Company	3.2.3	Equipment Hoisting and Entry	** Company, * Municipal Urban Construction Supervision Co., Ltd.
1.2.8	On-site Evaluation and Sign Evaluation Memorandum	Foreign Institutions	3.2.4	Installation and Construction	** Company, * Municipal Urban Construction Supervision Co., Ltd.
1.2.9	Approval by Foreign Institutions	FF Company, J City Development and Reform Commission (DRC), J City Finance Bureau, S Provincial DRC, S Provincial Finance Department	3.2.5	Request for Project Progress Payment	** Company, FF Company, Municipal Finance Bureau, Provincial Finance Department, ** Export-Import Bank, Bidding and Procurement Division of ** Machinery Import and Export (Group) Co., Ltd.
1.2.10	Submit to Provincial DRC and Finance Department	S Provincial DRC, FF Company, J City Engineering Design Institute	3.3	Commissioning and Training	
1.2.11	Expert Review	S Provincial DRC	3.3.1	Flushing and Pressure Test of Process Equipment	** Company, * Municipal Urban Construction Supervision Co., Ltd.
1.2.12	Official Approval of Feasibility Study Report		3.3.2	Power-on Debugging of High and Low Voltage Electrical Equipment	** Company, * Municipal Urban Construction Supervision Co., Ltd.
1.3	Select Tendering Agency	FF Company, Finance Bureau, Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd.	3.3.3	Joint Commissioning and Trial Operation of Energy Station	** Company, FF Company, * Municipal Urban Construction Supervision Co., Ltd., Design Institute
1.4	Prepare and Approve Fund Application Report		3.3.4	Training Services	** Company, FF Company
1.4.1	Prepare Fund Application Report	Design Institute, FF Company	4	Completion Acceptance Phase	
1.4.2	Owner Proposes Revision Opinions	FF Company	4.1	Audit and Liquidation	
1.4.3	Determine Submission Draft of Fund Application Report	Design Institute	4.1.1	Equipment Supply Liquidation	FF Company, * Municipal Urban Construction Supervision Co., Ltd.
1.4.4	Submit Fund Application Report for Approval	FF Company, Three-level DRC (National, Provincial, Municipal)	4.1.2	Construction Work Quantity Liquidation	FF Company, * Municipal Urban Construction Supervision Co., Ltd.

1.4.5	Official Approval of Fund Application Report	National Development and Reform Commission (NDRC)	4.1.3	Prepare and Submit Completion Data	** Company, * Municipal Urban Construction Supervision Co., Ltd., FF Company
1.5	Sign Project Loan Agreement and Re-lending Agreement	Foreign Institutions, Export-Import Bank, FF Company	4.1.4	Environmental Impact Assessment and Testing	Consulting Company
2	Bidding and Procurement Phase		4.2		
2.1	Prepare Tender Documents		4.2.1	On-site Acceptance	FF Company, * Municipal Urban Construction Supervision Co., Ltd., Design Institute, Auditor
2.1.1	Prepare Technical Tender Documents	FF Company	4.2.2	Energy Station Rectification	Winning Bidder Company
2.1.2	Prepare Commercial Tender Documents	Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd., FF Company	4.2.3	Sign Completion Acceptance Report	** Company, FF Company, * Municipal Urban Construction Supervision Co., Ltd., Design Institute, Auditor
2.1.3	Form Submission Draft of Tender Documents and Translate	Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd.	4.3	Acceptance and Payment Request	
2.1.4	Submit Tender Documents for Approval	Bidding and Procurement Division of China National Machinery Import and Export (Group) Co., Ltd.	4.3.1	Issue Performance Bond	** Company
2.1.5	Foreign Institutions Issue No Objection Letter to Tender Documents	Foreign Institutions, Consulting Company, Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd.	4.3.2	Request for Project Acceptance Payment	Winning Bidder Company, FF Company, * Municipal Finance Bureau, * Provincial Finance Department, ** Export-Import Bank, Bidding and Procurement Division of ** Machinery Import and Export (Group) Co., Ltd.
2.2	Bidding Phase				
2.2.1	Online Listing	Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd.			
2.2.2	Bid Preparation	Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd.			
2.2.3	Bid Opening and Evaluation	FF Company			
2.2.4	Foreign Institutions	Foreign Institutions			

	Issue No Objection Letter to Bid Evaluation Results	
2.2.5	Publicize Results and Issue Winning Bid Notification	Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd.
2.3	Signing and Entry into Force of Winning Bid Contract	
2.3.1	Negotiate and Sign Winning Bid Contract	Winning Bidder Company, FF Company, Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd.
2.3.2	Issue Advance Payment Bond and Performance Bond	** Company
2.3.3	Winning Bid Contract Enters into Force	Bidding and Procurement Division of ** Import and Export (Group) Co., Ltd., Foreign Institutions

Table 3 presents the specific responsible entities corresponding to each specific task during the implementation of FF Company's heating project.

4.3. Phase 3: Duration Calculation—Defining Assessment Requirements for Project Schedule Management

Quantified assessment criteria are indispensable for the effective implementation of Management by Objectives (MBO). Table 1 and Table 2 clarify the main tasks and precedence relationships in project implementation, while Table 3 identifies the specific responsible entities corresponding to each task—all of which are essential basic elements in project schedule management. The ultimate focus of genuine schedule management lies in "time limits," i.e., the duration required to complete the project progress. The determination of project duration serves as a crucial benchmark for controlling project progress. Otherwise, project schedule management would be out of the question. Therefore, how to determine a reasonable project duration is of crucial importance.

The theory of management by objectives holds that objectives based entirely on incorrect predictions may actually be more dreadful than having no objectives at all.In other words, determining an incorrect project duration is more alarming than not setting a duration at all. Generally, when defining objectives, factors such as practical needs, long-term planning, historical context, and current status should be taken into account. Objectives should be ambitious and innovative, ra-

ther than merely pursuing safety and convenience; at the same time, objectives should not be set too low. Overly low goals fail to motivate employees, while excessively high goals impose significant pressure on them, increasing the likelihood of unethical behaviors occurring under such pressure (Cai, 2013).

Considering that there are no unified standard schedules for foreign government loan projects, we calculated the ideal duration for each task in the Work Breakdown Structure (WBS) table of FF Company's heat supply project using the three-time estimation method in the Program Evaluation and Review Technique (PERT). This calculation is based on the operational experience of 10 projects funded by the French Development Agency (AFD) obtained through interviews, combined with the practical experience of FF Company's team.

The calculation method for the expected duration in Table 4 is as follows:

Table 4. Estimation of the duration of some tasks in the heat supply project for FF company.

Task Code	Task Name	Optimistic Time	Most Likely Time	Pessimistic Time	Expected Duration
1.1.1	Determine the Design Institute	18	20	23	20
1.1.2	Put Forward Design Requirements	10	15	15	14
1.2.1	Provide Original Data	3	5	7	5
1.2.2	Complete the Preliminary Feasibility Report	20	25	30	25
1.2.3	Improve the Report and Form a Submission Draft	5	10	15	10
1.2.4	Translate the Report	5	7	9	7
1.2.5	Submit to Consulting Companies and Foreign Institutions	8	10	12	10
1.2.6	Put Forward Questionnaires	5	10	12	10
1.2.7	Reply to Questionnaires and Complete Research Reports	5	10	12	10
1.2.8	On-site Evaluation and Signing Minutes	3	5	7	5
1.2.9	Reply from Foreign Institutions	3	6	7	6
1.2.10	Report to the Provincial Development and Reform Commission and the Department of Finance	5	10	12	10
1.2.11	Expert Review	2	3	5	3
1.2.12	Formal Approval of the Report	2	3	5	3
1.3	Select Tendering Agency	20	30	35	29
1.4.1	Prepare Fund Application Report	20	25	30	25
1.4.2	Owner Puts Forward Revision Opinions	3	5	7	5
1.4.3	Determine the Fund Application Report and Submit the Draft	3	5	7	5
1.4.4	Review of Fund Application Report	20	30	35	29
1.4.5	Formal Approval of Fund Application Report	5	10	15	10
1.5	Sign Project Loan Agreement and Transfer Agreement	40	60	65	58

Table 4 presents the basic data on which the duration calculation is based and the final duration calculation results during the advancement of FF Company's heating project. For the assessment within FF Company, performance appraisal grades for different durations can be determined.

$t_e = \frac{t_o + 4t_m + t_p}{6}$, where t_e represents the expected duration, t_o the optimistic time, t_m the most likely time, and t_p the pessimistic time. Through the duration calculation in Table 4, a comprehensive understanding of the most optimistic duration, most likely duration, pessimistic duration, and expected duration for the entire project and each project phase can be obtained. Based on this, assessment requirements for the project progress duration can be put forward to the responsible entities for specific tasks in accordance with the aforementioned timeframes.

For example, FF Company determines the duration for the design institute: those completed within 18 days will be rated as Performance Appraisal Grade A (the best grade), those completed within 18 - 20 days as Performance Appraisal Grade B (middle grade), those completed within 20 - 23 days as Performance Appraisal Grade C, and those completed in 23 days or more will be rated as failing grade. Different appraisal grades correspond to different salary and welfare packages. In this way, the responsible departments and persons within the company are encouraged to continuously improve work methods and enhance work efficiency around the optimal performance, so as to achieve the optimal effect of project progress.

It should be noted that for the assessment of internal departments of the company, the overall duration of all projects under their charge can be assessed. For individual employees, the duration of specific projects they are responsible for can be assessed individually. Finally, when the company conducts performance appraisal for the entire project, it can evaluate the role played by specific departments and personnel in the project promotion process based on the appraisal results, and then link it with salary and welfare, etc., so as to play a role in motivating employees.

For the contracting parties of FF Company's external cooperation, this time estimation will also play a "quasi-assessment" role. For example, after estimation, the time for the design institute to complete the preliminary draft of the feasibility study report is optimally 20 days, most likely 25 days, and most pessimistically 30 days. Then, when selecting a design institute and signing a service contract, the work requirement of completing the work optimally within 20 days is clearly put forward, and those that cannot be completed on schedule are not included in the scope of determining cooperation partners. When actually signing the contract, a penalty clause for breach of contract in case of failure to complete within 20 days overdue can be stipulated, so as to urge the contracting parties to actively perform their contractual obligations and thus achieve the expected project schedule.

4.4. Phase 4: Process Management—Monitoring and Adjusting Deviations in Project Schedule

In the specific implementation of **Management by Objectives (MBO)**, the approach mainly relies on employees' self-management, but this does not mean let-

ting things drift. MBO also emphasizes "management" itself. Managers must track the entire process, keep abreast of the progress of each objective, collect performance management data, and feed it back to employees. Such data should be promptly fed back to departments and employees. Departments and employees need to have access to the information required to measure their performance, and should obtain this information as soon as possible to make necessary adjustments in order to achieve the desired results. At the same time, feasible suggestions or necessary support should be provided to help departments and employees resolve relevant issues.

Specifically, in the schedule management of foreign government loan projects, it is necessary to closely monitor the target tasks, responsible entities, and evaluation cycles of each link—i.e., the specific content presented in Tables 1-4, identify problems in a timely manner, and propose targeted solutions after comprehensive consideration (e.g., by comparing costs and benefits). Through such proactive prevention, timely intervention, and forward-looking adjustments, we can gain the initiative for the smooth implementation of the project schedule, minimize delays and procrastination caused by external factors beyond our control, and ultimately maximize the improvement of the overall project progress.

For example, in the stages of preparing written materials—such as revising the feasibility study report to form a submission draft, responding to questionnaires, and compiling fund application reports—if slow progress is detected, the situation should be promptly notified to the relevant departments and personnel to facilitate their timely adjustments. Meanwhile, the "mandatory compression method" (i.e., project "crashing") can be adopted to resolve the issue as soon as possible. Based on the company's actual situation, measures such as temporarily coordinating with participants to increase human resource input or extending working hours within a specific concentrated period can be taken to shorten the work cycle and achieve the ideal schedule.

Another example is the project approval process: schedule delays often occur due to lengthy approval procedures. Given the large number of approval departments and complex decision-making links, the approval of feasibility documents, bidding documents, and bid-winning results tends to be slow. In such cases, it is necessary to promptly develop plans to compress the duration of subsequent project schedules to offset the delays caused by this link.

Furthermore, in the construction phase, construction progress may be delayed due to insufficient basic construction conditions. At this point, it is essential to adjust work relationships—for instance, changing critical sequential tasks to parallel or alternating execution—or adopt other methods to shorten the project cycle.

In short, during the implementation of a specific project, unexpected problems of various types that affect the project schedule constantly arise. The key is to:

1) Compare against the previously established project schedule;

2) Motivate responsible departments and individuals to advance as scheduled

by strengthening performance appraisal;

3) Closely monitor the implementation process;

4) Once potential or inevitable schedule deviations are identified, make timely and targeted adjustments.

By doing so, we can minimize the adverse factors affecting the project cycle to the greatest extent, thereby seizing the initiative and gaining time for the smooth implementation of the overall project schedule.

In foreign government loan projects, "process management" serves as the "core engine" of project schedule management. It is necessary to closely focus on the three core elements: WBS task objectives (Table 1, Table 2), division of responsibilities (Table 3), and duration calculation (Table 4). Through full-process tracking, monitoring, and deviation adjustment, process management realizes feedback and optimization of the previous three phases, solves the problem of "what to do if management is ineffective", and forms a "planning-execution-monitoring-optimization" cycle. Specifically, the closed-loop management is activated through a three-tier feedback mechanism:

First, "deviation monitoring and real-time intervention". Managers track the progress of each task throughout the process, collect performance data, and promptly feed it back to the responsible departments and individuals to ensure they grasp the information needed to measure their performance and quickly adjust work strategies. For example, if it is found that the progress of a certain approval task lags behind the ideal duration, the approval department can be coordinated to optimize processes or supplement materials by comparing costs and benefits, so as to correct deviations in a timely manner and avoid the expansion of deviations. This mechanism directly inherits the quantitative standards of duration calculation and ensures that the execution of responsible entities does not deviate from the objectives.

Second, "problem tracing and proactive optimization". If similar deviations occur repeatedly during the process (such as delays in multiple construction tasks due to overlapping responsibilities), it is necessary to trace back to the "responsibility division" phase, optimize the post responsibility list, and clarify collaborative boundaries; if it is found that there is a large gap between the ideal duration and actual execution (such as a task continuously exceeding the time limit due to non-human factors), it is necessary to trace back to the "duration determination" phase, revise the time estimation model based on the latest practical data, and improve the accuracy of duration calculation; if it is found that there are omissions or logical confusion in task decomposition (such as poor connection between tasks in a certain phase), it is necessary to trace back to the "task objective determination" phase, optimize the WBS structure, and improve task correlations.

Third, "experience accumulation and long-term iteration". The deviation data, adjustment plans, and problem-solving experience collected in process management can be used as reference for subsequent similar foreign government loan projects, optimizing WBS decomposition templates, responsibility division frame-

works, and duration calculation parameters. This enables closed-loop management to not only serve the current project but also promote the continuous improvement of management levels for subsequent projects, forming an "inter-project iterative closed loop".

4.5. The Logical Closed Loop of the Four Phases of Management by Objectives

In the schedule management of foreign government loan projects, the four phases—task objective determination, responsibility division, duration determination, and process management—form a mutually supportive and progressively cyclic closed-loop management system through the logical chain of "goal guidance - responsibility implementation - standard quantification - dynamic optimization - feedback iteration". This closed loop not only conforms to the core essence of Management by Objectives (MBO) of "self-control + process control" but also accurately adapts to the characteristics of foreign government loan projects, such as complex approval procedures, multiple participants, strict schedule constraints, and no unified standard schedule requirements. It realizes the full-process controllability of project schedule from planning to implementation, and from monitoring to optimization.

"Task objective determination (establishing WBS)" decomposes the overall goal of the foreign government loan project into four phases—approval and project initiation, bidding and procurement, supply and installation, and completion acceptance—through structural decomposition. It is further refined into several sub-tasks and clarifies the precondition connection relationships, solving the problem of "what to manage".

"Responsibility division" inherits the results of WBS decomposition, accurately matches the refined tasks to the corresponding departments and individuals, converts the "task list" into a "responsibility list", and solves the problem of "who will manage" the implementation subject.

"Duration determination" inherits the task list and responsibility division from the previous two phases, sets scientific and reasonable "ideal durations" for each WBS task, solves the problems of "to what extent to manage" and "determining the assessment basis". It transforms the abstract "project schedule" into measurable indicators, shifting schedule management from "qualitative requirements" to "quantitative management and control", and improving the scientificity and operability of management.

"Process management" realizes feedback and optimization of the previous three phases through full-process tracking, monitoring, and deviation adjustment, solving the problem of "what to do if management is ineffective" and forming a management cycle of "planning - execution - monitoring - optimization". Managers track the progress of each task throughout the process, collect performance data, and promptly feed it back to the responsible departments and individuals to ensure they grasp the information needed to measure their performance, quickly

adjust work strategies, correct deviations in a timely manner, and avoid the expansion of deviations. This mechanism directly inherits the quantitative standards of duration calculation and ensures that the execution of responsible entities does not deviate from the objectives.

In summary, task objective determination provides the "management object", responsibility division provides the "implementation subject", duration determination provides the "quantitative benchmark", and process management provides "feedback iteration". The four phases are progressive and mutually feedback. They not only realize the dynamic controllability of the current project schedule but also promote the continuous optimization of the management system through experience accumulation, ultimately forming a complete closed loop suitable for the schedule management of foreign government loan projects.

5. Conclusion and Recommendations

5.1. Conclusion

Foreign government loan projects face significant challenges in progress management due to complex procedures and multiple stakeholders. This study demonstrates that MBO is an effective solution: through systematic task decomposition, clear responsibility allocation, scientific duration estimation, and dynamic process monitoring, it can shorten project cycles and maximize the effectiveness of foreign capital utilization. FF Company's case confirms that MBO aligns with the characteristics of foreign government loan projects and provides a practical implementation framework.

The research findings of this paper are mainly applicable to Agence Française de Développement (AFD) loan projects, and also provide a reference for accelerating project progress in German promotional loans, Israeli government loans, loans from other international financial organizations, and even domestic government procurement projects. Most objectives in MBO are usually short-term ones: annual, quarterly, monthly, etc. Such short-term objectives are relatively specific and easy to decompose. Compared with other types of management, project schedule management more obviously reflects the characteristics of short-term management behavior, so the application of MBO is obviously a very reasonable choice. Therefore, MBO has strong applicability for the schedule management of any foreign government loan project. Specifically, at the initial stage of project construction, it is crucial to reasonably plan the project schedule and realize the rational allocation of resources. A feasible MBO plan for project schedule is a prerequisite for the smooth progress and timely completion of the project.

5.2. Potential Application Challenges

However, three potential challenges may be encountered:

1) The premise of applying MBO is that organizational members have strong self-management capabilities. If the members involved in project management have weak self-management awareness and capabilities, even if the goals for their

work efforts have been specified, they may still fail to consciously strive towards the goals in the work process. Therefore, the organization's values and philosophy must be integrated into organizational goals and specifically decomposed objectives, and the characteristics of the objectives should influence the behavior of organizational members. Therefore, before implementing MBO, we should reflect on the project's values and philosophy, its purpose and pursuits, so as to avoid difficulties in correcting subsequent problems due to inadequate consideration in this regard.

2) During the implementation of MBO, objectives should usually not be easily changed, as doing so will lead to organizational chaos. This will make management operations lack flexibility and unable to adapt to the ever-changing external environment through rapid adjustments. However, in the project management of foreign government loans, there are many stakeholders and numerous workflow links. Sometimes, the progress of the project cannot proceed as planned due to subjective and objective reasons. Therefore, in the process of MBO, when implementing the established objectives and tasks, we should jump out of the achievement of "small objectives" according to the actual situation, and closely focus on the "general direction" of the ultimate goals and effects of project management, make interest trade-offs according to the actual project construction, and avoid the adverse consequence of overall project delay caused by the delay of one link.

3) Conflicts among various project participants will inevitably affect the consensus on goals and the progress as scheduled. There are obvious interest conflicts among at least three project participants in foreign government loan projects: First, there is an interest game between the parties to the winning contract of a foreign government loan project during contract negotiations. Second, when compiling the bidding documents, the owner will put forward specific technical requirements for core electromechanical equipment based on its actual needs, while the lender will pay more attention to the compatibility of the technical requirements in the bidding documents and the compliance of the process to ensure that potential bidders can fully compete during the bidding phase. In addition, after winning the bid, the general contractor of the project needs to coordinate the advance payments for different equipment from dozens of equipment manufacturers, and also needs to contact local installation teams, resulting in great pressure of advance funds and a desire to accelerate the disbursement of loans. The lender pays more attention to the risk of loan disbursement and will only disburse the loan after conducting confirmation and compliance review in strict accordance with the payment application process.

5.3. Recommendations

In the implementation of schedule management for foreign government projects, we should comprehensively consider the advantages and disadvantages of the application of Management by Objectives (MBO), and carry out specific management work in a way that adapts to local conditions and adjusts to changing times.

First, flexibly adjust processes and resource input. A feasible project schedule is a prerequisite for the smooth progress and on-time completion of the project. At the initial stage of project construction, it is crucial to rationally plan the project schedule and allocate resources appropriately. However, it is not advisable to mechanically adhere to the precedence and successor relationships of various work tasks in the project schedule; instead, adjustments should be made according to the priorities of the actual project construction to avoid the adverse consequence of overall project delay caused by the delay of a key link.

Second, lay a solid foundation in the project approval and application phase. The project approval and application phase is almost the most time-consuming part of the entire project construction process. The Feasibility Study Report and Fund Application Report cover all contents of the project construction. It is necessary to do a good job in basic work, consult experts extensively, and investigate high-quality similar projects to ensure that the project construction content and technical level meet advanced technical standards, thereby effectively avoiding repeated revisions of documents in the subsequent lengthy approval process.

Third, respond to abnormal situations in the bidding phase efficiently and transparently. In the process of compiling project bidding documents, adequate preparation of commercial and technical clauses should be made, and the linguistic expressions in both Chinese and English versions of the bidding documents should be carefully deliberated. For parts prone to ambiguous understanding, the priority language should be clearly specified. The potential sole tendency in technical bidding documents should be carefully considered, and technical asterisk indicators should be defined as technical parameters that guarantee equipment grade and technical category. This avoids potential bidders' challenges that may be caused by exclusive technical indicators, and contingency plans should be formulated to respond to unreasonable challenges.

Fourth, Balancing Pros and Cons in Contract Negotiations. After selecting the winning bidder through the bidding process, the equipment and installation services provided in the winning bidder's proposal are already able to meet the owner's requirements. Usually, the owner is in an advantageous position during the subsequent negotiations on the winning contract, and often puts forward some requirements beyond the bidding scope. At this time, since the winning bidder has not yet signed the contract and entered the site, they will inevitably worry about potential risks, obligations, or responsibilities regarding the expected requirements proposed by the owner, which will delay the negotiation progress. Therefore, during the negotiation process, it is recommended to negotiate and resolve the key issues of both parties in the game. For some issues that can be solved through other low-cost methods during the construction process, they should be temporarily shelved to promote the accelerated progress of the project.

Fifth, take an overall perspective to mobilize the enthusiasm of all participating parties. Foreign government loan projects involve lengthy processes and numerous participating parties. During the application process, the owner unit (the loan

user) should strengthen communication with the relevant persons in charge of the municipal and provincial Development and Reform Commissions (DRCs) responsible for document approval and the lender's office to promptly resolve potential issues. Before the official supply and installation of the project, the owner unit should convene all project participants, including the winning bidder, supervision unit, and design unit, to conduct sufficient pre-construction technical and safety communication, unify the interest demands of all parties, and make overall arrangements in advance to ensure the efficient and smooth completion of the project.

Author Contributions

Ziheng Zu: Conceptualization, Formal Analysis, Investigation, Methodology, Writing-original draft.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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