

CHAPTER 6

PROJECT FUNCTIONS AND ACTIVITIES DEFINITIONS FOR TOTAL PROJECT COST

1. INTRODUCTION

Because of an obvious disparity of opinions and practices with regard to what exactly is included in total estimated cost (TEC) and total project cost (TPC), guidelines were developed and are included in this chapter. The development of guidelines is important because it provides consistency in estimating and reporting of project costs and it provides uniformity of information used for cost data bases. It should be noted that TEC does not apply to most of the EM projects; only TPC applies.

2. DEFINITIONS

Total project cost is defined as all costs specific to a project incurred through startup of a facility, but prior to the operation of the facility. Thus, TPC includes TEC and other project costs (OPC), or

$$\text{TEC} + \text{OPC} = \text{TPC}.$$

A. Total Estimated Cost

TEC is defined as all engineering design costs (after conceptual design), facility construction costs, and other costs specifically related to those construction efforts. These are typically capitalized. TEC will include, but not be limited to: project and construction management during Titles I, II, and III; design and construction management and reporting during design construction; contingency and economic escalation for TEC-applied elements; ED&I during Titles I, II, and III; contractor support directly related to design and construction; and equipment and refurbishing equipment.

B. Other Project Costs

OPCs are defined as all other costs related to a project that are not included in the TEC, such as supporting research and development, pre-authorization costs prior to start of Title I design, plant support costs during construction, activation, and startup. OPCs will include, but not be limited to: research and development; NEPA documentation; project data sheets (PDSs); CDR; short form project data sheets; surveying for siting; conceptual design plan; and evaluation of RCRA/EPA/State permit requirements.

C. Total Project Cost

TPC is defined as all costs specific to a project incurred through the startup of a facility but prior to the operation of a facility. It is comprised of TEC and OPC. TPC will include, but not be limited to, activities such as: design and construction; contingency; economic escalation; Pre-Title I activities; feasibility study reports (FSRs); maintenance procedures (to support facility startup); one-time start-up costs, initial operator training, and commissioning costs; and operating procedures (to support facility start-up).

3. DISCUSSION OF CHARTS

Table 6-1 is a matrix that summarizes the different individual project activities and indicates their designation with respect to TPC and TEC. The project activities identified are divided into different phases of project development. The activities are charged to the different functions that comprise TEC and OPC and are shown in the sequence they would most likely occur.

A. Different Phases of Project Development

The different individual project activities identified are divided into different stages of project development. The first section of the matrix identifies activities encountered during pre-authorization or Pre-Title I design. The second section of the matrix identifies activities encountered during Titles I and II of design. The matrix progresses in that manner to include Title III design and start-up.

B. Different Functions of Total Estimated Cost and Other Project Cost

The different project activities are allocated to different project functions with respect to TEC and OPC. The activities are designated as based on the project phase under which the activity occurs.

1. Total Estimated Cost

TEC is divided into costs associated with ED&I, project management (PM), construction management (CM), and construction contractors (CC).

- a. ED&I: ED&I activities include the engineering and design activities in Titles I & II, the inspection activities associated with Title III, and activities defined in the Brooks Bill (e.g., the 6 percent allowed for design, drawings, and specifications).
- b. PM: Project management covers those services provided to the DOE on a specific project, beginning at the start of design and continuing through the completion of construction, for planning, organizing, directing, controlling, and reporting on the status of the project.
- c. CM: Construction management covers those services provided by the organization responsible for management of the construction effort during Title I and Title II design, and continuing through the completion of construction. CM services are further defined in DOE Order 4700.1, PROJECT MANAGEMENT SYSTEM.
- d. CC: Construction contractors cover salaries, travel, and other expenses of engineers, engineering assistants, and their secretarial support responsible for engineering and design performed by the construction contractor. When work normally performed by an architect/engineer (A/E) is performed by a CC, the associated costs are charged to the applicable ED&I accounts.

2. Other Project Cost

Any activities that are not representative of TEC functions are allocated to OPC. They are typically Pre-Title I activities, startup costs, and some support functions.

4. COST ALLOCATIONS

The definitive document within DOE for allocations of cost is DOE Order 2200.6, FINANCIAL ACCOUNTING, but a general discussion of cost allocations follows.

A. Plant and Capital Equipment (PACE) Fund

The Plant and Capital Equipment (PACE) Fund provides funding for the plant and its basic equipment/furnishings. This fund is for conventional construction projects only.

B. Operating Expense Fund

The Operating Expense Fund provides funding for ongoing activities, such as laundry, cleaning, etc. These items are typically captured in site overhead accounts and then allocated to projects as site overhead. Operating expense funded items more directly related to projects are items such as Pre-Title I and start-up activities, etc.

C. Usage

Once standard definitions are developed and the different project activities are identified, it is then possible to uniformly allocate costs to the different project development activities. Table 6-2 is a matrix that summarizes recommended cost allocations for operating expense and PACE (ED&I and construction). It is important to note that the estimator should refer to these tables throughout the entire life of a project.

TABLE 6-1					
TPC AND TEC GUIDANCE AND CLARIFICATION INCLUSION OF DETAILED ACTIVITIES IN TPC AND/OR TEC					
ACTIVITY	TPC				
	OPC	TEC			
		ED&I	P M	CM	CC
1. PRE-KEY DECISION - 0 (Prior to Determination of Mission Need)					
A. Engineering Study	X				
B. Alternatives Assessment/Site Selection Studies	X				
C. Surveying for Siting	X				
D. Capital Review Board	X				
E. Candidate Projects (support sheet and presentation to DOE)	X				
F. Conceptual Design Plan	X				
G. Work Orders - CDR Preparation, etc.	X				
H. Integrated Programmatic/Project Schedule (R&D, Safety, Environmental, Operations, etc.)	X				
I. Requirements for Safety Analysis Determination	X				
J. Functional Design Criteria	X				
K. Evaluation of RCRA/EPA/State Permit Requirements	X				
L. Cultural Resources Review	X				
2. Key Decision - 0 and Key Decision - 1 (Determination of Mission Need and Approval of New Start)					
A. Conceptual Design Report	X				
B. Design Reviews	X				
C. NEPA Documentation	X				
D. Conceptual Project Schedule	X				
E. Plant Forces Work Review	X				
F. Energy Conservation Report	X				

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ACTIVITY	TPC				
	OPC	TEC			
		ED&I	P M	CM	CC
G. Economic/Life Cycle Cost Analysis	X				
H. Alternative Engineering (before Title I)	X				
I. Physically Handicapped Review	X				
J. Energy System Acquisition Advisory Board and Acquisition Executive Review Board Support	X				
K. Preliminary Safety Analysis Report (PSAR)	X				
L. Facility/Project Security Review and Plan	X				
M. Facility Security Vulnerability Assessments	X				
N. Master Safeguards & Secure Analysis	X				
O. Construction Project Data Sheet (CPDS)	X				
P. ES&H Requirements Assessment	X				
Q. Strategic Facility Assessment	X				
R. Budget/Conceptual Estimates, as required (Parametric Assessments)	X				
S. Project/Validations Support	X				
T. Monthly Conceptual Status Report	X				
U. Architect/Engineer (A/E) Selection and Statement of Work Development	X				
V. Identification of Project Record Requirements	X				
W. Project Management Plan (PMP)	X				
X. Project Quality Assurance (QA) Plan	X				
Y. Configuration Management Plan (CMP)	X				

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TPC AND TEC GUIDANCE AND CLARIFICATION INCLUSION OF DETAILED ACTIVITIES IN TPC AND/OR TEC					
ACTIVITY	TPC				
	OPC	TEC			
		ED&I	P M	CM	CC
Z. Pilot Plants	X				
AA. Research and Development (Project Specific)	X				
AB. Facility As-Built/Existing Condition Drawings (Prior to Design Start)	X				
AC. Obtain Permits Required Prior to Start of Construction (before Title I)	X				
3. Key Decision - 1 and Key Decision - 2 (Approval of New Start and Start of Detailed Design: Title I and II Activities)					
A. PMP Revisions			X		
B. CPDS Revisions			X		
C. Integrated Detailed Project Schedules/Critical Path Analysis			X		
D. Project Revalidations			X		
E. Project Authorization Modification Support			X		
F. A/E Internal Design Coordination		X			
G. Identification of Long Lead Procurements		X			
H. Design Studies		X			
I. Design Calculations & Analysis		X			
J. CADD and other Computer Services		X			
K. Cost Estimates			X		
L. Procurement & Construction Specification Development		X			
M. Design Reviews by Project Team		X	X		
N. Design Review Support	X	X			

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TPC AND TEC GUIDANCE AND CLARIFICATION					
INCLUSION OF DETAILED ACTIVITIES IN TPC AND/OR TEC					
ACTIVITY	TPC				
	OPC	TEC			
		ED&I	P M	CM	CC
O. Drawings		X			
P. Project Schedules			X	X	
Q. Acceptance Test Procedures & Plans		X		X	
R. Certified Engineering Reports		X			
S. Research & Development (required to complete project as defined by KD-0)	X				
T. Performance Evaluations of A/E			X		
U. Inspection Planning			X	X	
V. Surveys - Support Design			X		
W. Design Cost & Scheduling Analysis & Control		X			
X. Decision Progress Reporting		X	X	X	
Y. Design QA Plan and Overview		X	X		
Z. Constructibility Reviews			X	X	
AA. Safety Reviews by A/E		X			
AB. Regulatory Overview by A/E		X			
AC. Reproduction - for Design		X			
AD. Travel - Support Design		X			
AE. Obtain Permits Required Prior to Start of Construction (after Title I)	X				
AF. Change Control - for Design		X	X		
AG. Value Engineering (after Title I)			X		

TABLE 6-1					
TPC AND TEC GUIDANCE AND CLARIFICATION					
INCLUSION OF DETAILED ACTIVITIES IN TPC AND/OR TEC					
ACTIVITY	TPC				
	OPC	TEC			
		ED&I	P M	CM	CC
4. Key Decision - 3 Approval to Start Construction or Full Scale Development to Key Decision - 4: Approval to Commence Operations or Pre-Production (Title III Activities)					
A. Bid Package Preparation			X	X	
B. Bid Evaluations, Opening and Award			X	X	
C. Construction Coordination and Planning			X	X	
D. Contract Administration			X	X	
E. Engineering Support (A/E)			X		
F. Design Changes/Control		X	X	X	
G. Non-Conformance Reports (NCRs)			X	X	
H. Control Systems for Construction Activities			X	X	
I. Project Assessment & Reporting		X	X	X	
J. Construction Status Reports and Meetings			X	X	
K. Davis-Bacon Administration			X	X	
L. Vendor Submittals		X	X	X	X
M. Field Support of Construction			X	X	
N. Field or Lab Tests				X	
O. Radiation Control Timekeepers					X
P. Radiation Protection by Contractor			X		
Q. Safety and Safeguard/Security Operations				X	X
R. M&O Contractor/M&O Project Support During Construction	X				
S. Project Estimates (Purpose Dependent)		X	X	X	

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TPC AND TEC GUIDANCE AND CLARIFICATION					
INCLUSION OF DETAILED ACTIVITIES IN TPC AND/OR TEC					
ACTIVITY	TPC				
	OPC	TEC			
		ED&I	P M	CM	CC
T. Quality Control (QC) Inspection			X	X	X
U. Inspection and Acceptance		X		X	
V. Negotiations of Fixed Price Contract Changes			X	X	
W. Trips to Vendor/Fabricators		X	X	X	X
X. Procurement Coordination			X	X	X
Y. Equipment/Hardware Cost				X	X
Z. Material Procurement Rate				X	X
AA. Initial Office Furniture and Fixtures					X
AB. Spare Parts Inventory	X				
AC. Installation/Alterations					X
AD. Disposal of Mixed Waste					X
AE. Cost Plus Award Fee/Fixed Price Construction		X			X
AF. Plant Forces Work					X
AG. Initial Spares					X
AH. Safety Plan & Overview				X	X
AI. Decontamination (exceeds normal operating levels)	X				
AJ. Decontamination (as removal cost)					X
AK. Surveying to Support Construction			X	X	X
AL. Interest Penalties		X	X	X	X

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TPC AND TEC GUIDANCE AND CLARIFICATION INCLUSION OF DETAILED ACTIVITIES IN TPC AND/OR TEC					
ACTIVITY	TPC				
	OPC	TEC			
		ED&I	P M	CM	CC
5. Key Decision - 4: Planning and Preparation for Acceptance/Operational Startup and Pre-production for Commencement of Operations					
A. Perform Acceptance Testing			X		X
B. Perform Operation Acceptance Testing	X				
C. Final Safety Analysis Report (FSAR)			X		
D. Operational Readiness Review (ORR)	X				
E. Start-up Costs	X				
F. Training of Operators	X				
G. As-Builts		X	X		X
H. Project Closeout			X		
I. A/E & Construction Performance Appraisals			X		
J. User Move-In	X				
K. Develop Operating Procedures, Manuals, and Documentation	X				
L. Operations Planning	X				
M. Safety and System Integration	X				
N. Safety Evaluation Report (SER)	X				
O. Post-Acceptance Testing	X				
P. Start Up Coordination, Materials, and Supplies	X				
Q. Correction of Design/Construction Deficiencies					X
R. Transition Planning			X	X	X

TABLE 6-2
RECOMMENDED GENERAL COST ALLOCATION MATRIX

PROJECT DEVELOPMENT ACTIVITY	PROJECTS ¹		
	OPERATING EXPENSE	P&CE	
		ED&I	CONSTR.
Pre Title I	X		
Title I		X	
Title II		X	
Title III		X	
Construction	X ²		X
Construction Management			X
Project Management		X ³	X ³
Project Support	X		
Startup	X		
<p>¹ Applies to Line Item Projects, Major Projects, and Major Systems Acquisitions.</p> <p>² Capital funding for betterments, conversions, and replacements. Alterations are generally funded by operating expense.</p> <p>³ Project management during the design phase of Line Item Projects, Major Projects, or Major Systems Acquisitions authorized <u>for design only</u> is funded by P&CE-ED&I.</p>			

Reference: DOE Order 2200.6, FINANCIAL ACCOUNTING.