

CHAPTER 9

OPERATING COSTS

1. INTRODUCTION

The content of this cost estimating guide is primarily focused on capital costs for conventional construction and environmental restoration and waste management projects. For some projects, particularly environmental remediation projects, the operating costs over the life of the project can be several orders of magnitude larger than the initial capital costs. Therefore, it is important to examine operating cost estimates and verify that all elements of the project have been considered and properly estimated.

2. OPERATING COSTS FOR CONVENTIONAL CONSTRUCTION PROJECTS

This section discusses operating costs which begin after start-up associated with conventional construction projects. All projects are not the same; therefore, some of the costs outlined in this section may not be applicable to a given project. This should not detract from the usefulness of this section to cost estimators and reviewers. In addition, taxes and insurance, which are normally included in operating cost estimates, are not applicable for DOE conventional construction projects because the federal government is not subject to state or local property taxes and is self-insured.

A. Capital Recovery

The operating cost estimate should contain some mechanism for capital recovery. Depreciation is the method commonly used for conventional construction projects. Capital recovery will be a function of the interest rate and the facility's expected life.

B. Utility Costs

Utility costs are primarily comprised of conventional facility heating and cooling costs. Costs for utilities will be based on the utilities available to the facility (i.e., natural gas, fuel oil, electricity) and the climate at the facility's location. Steam, process water, and compressed air may also be required by the facility.

C. Labor Costs

Facilities constructed as conventional projects do not operate without labor. These facilities may employ various types of labor, including operations, technical, administrative, and clerical labor. The level of estimate detail will dictate the level of labor cost breakout in the estimate. For a detailed estimate, the reviewer should verify that all facility functions have been identified and properly estimated.

Operating costs should include provisions for salaries and labor burden, including medical benefits, vacation and holidays, and other employee compensation items. Labor overhead will consist of administrative costs for scheduling, payroll, etc., as well as costs for employee workspace maintenance. Labor overhead will be present regardless of the facility operating schedule, but labor costs may be a function of the facility's operating schedule, especially if shift work is involved.

D. Maintenance

Maintenance and upkeep of all facility components must be considered in the operating cost estimate. Maintenance and repairs should also include costs for labor, materials, and supervision. Facility equipment will have maintenance requirements, and vehicles used at the facility will require service and fluids (gasoline/diesel, oil). Spare parts for equipment and vehicles may also be maintained at the facility, and an allowance for spare parts should be provided in the operating cost estimate.

Buildings and their infrastructures at the facility, including phone lines and power generators, will require maintenance to remain in good condition. Regular housekeeping service is usually necessary. Service roads at the facility must be maintained. Facility grounds may also require maintenance, usually for aesthetic purposes.

Additional information on maintenance activities can be found in DOE Order 4330.2, CAPITAL ASSET MANAGEMENT PROGRAM.

E. Support Services

Support services include those miscellaneous services that may be needed at the facility. Drinking water, sanitation, waste disposal, site security, fire protection, cafeteria, and medical clinic/services are considered support services. Office supplies and expenses and small tools are also classified as support services. These items, if applicable, should be identified in the operating cost estimate. Temporary facilities during expansion or renovation may also require inclusion in an operating cost estimate.

F. Environmental Compliance/Permit Costs

In today's regulated environment, most conventional DOE facilities will require operating permits. Air permits and wastewater discharge permits are two examples of operating permits. These permits may contain annual compliance provisions, including monitoring or testing of effluent or air emissions. Costs for testing and analytical analysis must be included in the operating cost estimate. Operating costs for equipment mandated by permit provisions should also be considered.

G. Downtime Allowance

Facilities will not operate 100 percent of the time. Weather-related shutdowns, equipment repair and maintenance, emergencies, and employee work schedules will affect the number of hours operated per year. Some facilities may be prevented from operating pending acceptance of the facility work plan or other permit. Proper allowance for downtime is important if the operating costs were estimated on a percentage of hours operated basis. For conventional construction facilities, this is not a significant factor unless the facility's operating budget is dependent upon the number of hours operated. Maintenance and repair costs may also be a function of the number of hours of facility operation.

3. OPERATING COSTS FOR ENVIRONMENTAL REMEDIATION AND RESTORATION PROJECTS

This section discusses operating costs for environmental remediation and restoration projects. Each environmental project is unique; therefore, no two projects will have the same operating costs. It is the responsibility of the estimator and reviewer to verify that the operating cost estimate is consistent with activities which will be performed at the remediation/restoration site. Taxes and insurance, which are normally included in operating cost estimates, are not applicable for DOE environmental restoration and waste management projects because the federal government is not subject to state or local property taxes and is self-insured.

A. Capital Recovery

Capital recovery will be a function of the interest rate and the environmental remediation/restoration project's expected life. The operating cost estimate should contain depreciation expenses for capital recovery cost.

B. Utilities

Utility costs will consist of facility heating/cooling plus the energy required to run any waste treatment equipment at the facility. For example, operating costs for a project involving an on-site incinerator would include workspace heating/cooling

costs and the fuel requirements of the incinerator. Utility costs for environmental facilities will be a function of the utilities available to the facility, the climate at the facility's location, and the amount of material processed/handled at the facility. Steam, process water, and compressed air may also be required.

C. Labor Costs

Estimates of labor costs for environmental projects will be different than estimates for conventional projects because of job functions required by the project. For example, work at the facility may dictate the number of health and safety professionals working on the project, and additional technical support may be required for projects that involve new or experimental remediation technology. Labor salaries are usually higher because of additional certification and training requirements for personnel who work in the environmental remediation field.

Operating cost estimates should include provisions for salaries and labor burden, including medical benefits, vacation and holidays, and other employee compensation items. Labor overhead will consist of administrative costs for scheduling, payroll, etc., as well as costs for employee workspace maintenance. Training costs may increase labor overhead for environmental projects. Labor overhead will be present regardless of the project operating schedule, but labor costs may be a function of the facility's operating schedule, especially if shift work is involved. Labor scheduling should also contain an allowance for personnel decontamination time.

D. Maintenance

Maintenance and upkeep of all facility components must be considered in the operating cost budget for an environmental project. Maintenance and repairs should also include costs for labor, materials, and supervision. Facility equipment will have maintenance requirements, and vehicles used at the facility will require service and fluids (gasoline/diesel, oil). Specialized vehicles, such as earth movers and dump trucks, and specialized equipment, such as an incinerator, may also be used at the site on a routine basis. Spare parts for equipment and vehicles may be maintained at the facility, and an allowance for spare parts should be provided in the operating cost estimate.

Buildings and their infrastructures at the facility, including phone lines and power generators, will require maintenance to remain in good condition. Regular housekeeping service is usually necessary. Service roads at the facility must be maintained.

E. Support Services

Support services include those miscellaneous services that may be needed at the facility. Drinking water, sanitation, waste disposal, site security, fire protection, cafeteria, and medical clinic/services are considered support services. Office supplies and expenses and small tools are also classified as support services. These items, if applicable, should be identified in the operating cost estimate.

F. Downtime Allowance

Facilities will not operate 100 percent of the time. Weather-related shutdowns, equipment repair and maintenance, emergencies, and employee work schedules will affect the number of hours operated per year. Some facilities may be prevented from operating pending acceptance of the facility work plan or other permit. Proper allowance for downtime is important if the operating costs were estimated on a percentage of hours operated basis. Maintenance and repair costs may also be a function of the number of hours of facility operation.

G. Special Environmental Remediation/Restoration Project Costs

Special project costs for environmental projects include costs for transportation, protective equipment, monitoring, pollution control, permits, and analytical services. All environmental projects will have operating expenses in these areas.

The majority of environmental remediation/restoration projects will require that personnel wear protective equipment. This equipment must be decontaminated on a regular basis and kept in good working order. Site areas may also require personnel and/or ambient monitoring to protect human health and the environment.

Pollution control equipment is usually a permit requirement for waste treatment facilities, and the operation of this equipment must be considered in the operating cost estimate for environmental facilities. Environmental facilities are usually strictly regulated, and the facility permit conditions must be addressed in the operating cost estimate.

Analytical services can be a substantial portion of operating costs because environmental projects are usually characterized by a significant number of soil, water, air, or personnel monitoring samples. An on-site laboratory may be required for project analytical analyses. Provisions for all testing, analytic work, and an on-site laboratory must be made in the operating cost estimate.