CHAPTER 1

INTRODUCTION

1-1. Purpose.

This manual establishes criteria and standards for economic studies for projects in the military construction program (MCP) and provides detailed guidance for implementing these criteria. This manual serves as an aid to design professionals in fulfilling their responsibility to base decisions on sound economic studies, in accordance with current policy.

1-2. Scope.

This manual has been developed as a complete, self-contained document and includes all the information needed to perform the economic studies required for MCP projects. More specifically, this manual contains:

– A full, detailed and unified presentation of the criteria and standards that govern the conduct of the life cycle cost (LCC)—based economic studies required by Department of Defense (DOD) and higher authorities for MCP projects.
– Step-by-step instructions for performing life cycle cost analyses (LCCA) and related calculations in response to current requirements.
– Numerous worked-out examples of the individual calculations.
—Examples of complete life cycle cost analyses
– Tabular materials and sample worksheets developed to minimize the amount of calculation involved in economic studies and to maximize their effectiveness.

1-3. Background.

The design of a facility in the MCP may be viewed as a series of decisions or choices among alternative methods for satisfying functional requirements. The design progresses as each of these decisions is made and implemented—that is, as particular design alternatives are selected for use in the facility and incorporated into the design. In general, the basis for selecting particular alternatives for implementation is minimum life cycle cost.

a. Life cycle costs. The LCC for a facility (or for a design alternative) is the sum of all the costs that are expected to be incurred as the facility (or the design alternative) performs its function over a period of time. This sum is sometimes referred to as the *total cost of ownership*. It includes the costs of design, construction/procurement, energy, maintenance, operation (other than energy), repairs, alterations, and disposal.

b. Advantages of using LCCs. The LCC of a design alternative is the most complete indicator of the expected cost of obtaining, utilizing, and disposing of the alternative. Thus, LCCs provide the most valid basis for comparing the costs of completing design alternatives and for selecting the feasible alternative with the lowest cost. In addition, the LCC procedure permits careful consideration of the use, cost, and conservation of energy-an advantage particularly important in the design of MCP facilities, where the achievement of significant reductions in energy consumption is a statutory requirement.

c. Life cycle costs in economic studies. Life cycle cost analysis is a systematic procedure for measuring and comparing the LCC of two or more design alternatives and selecting the most cost effective one for implementation. The totality of all life cycle cost analyses performed for a particular MCP project, along with the related overall management effort, is referred to in this manual as the *economic study* for the project.

1-4. Cost data.

The objectives of this manual are satisfied in large part by means of illustrative material, which in most cases is presented in the form of simulated case histories for MCP projects. These simulated case histories were developed at the beginning of calendar year 1982, and utilize cost information that generally reflects market prices and cost-growth projections of that timeframe. (The differential escalation rates for fuel and energy, for example, are taken from projections developed by the Department of Energy for the Federal Energy Management Program (FEMP), Commercial Sector, and contained in the 1982 edition of the Code of Federal Regulations, in accordance with standard practice throughout the Department of Defense at that time.) In a number of cases, however, cost figures were constructed, or adjusted, primarily for instructional advantages (i.e., to help make a point). It is

important for the reader to recognize that the simulated case histories presented herein were developed primarily for the purpose of illustrating the proper interpretation and the proper implementation of the criteria of chapter 2 and the calculational procedures described in the other chapters of this manual. *They were not intended to provide cost guidance for future life cycle cost studies; nor were they intended to provide design guidance for future life cycle cost studies on the relative economic rankings of competing design alternatives.* Current market prices must be obtained on a case-by-case basis at the time an economic study is conducted, and cost-growth projections must be obtained in accordance with the provisions of chapter 2.

1-5. References.

The following documents are referenced in this manual:

Code of Federal Regulations (CFR) Title 10 (Energy) Part 436, Subpart A (10 CFR 436A)

Office of Management & Budget (OMB) Circular No. A-94, "Discount Rates to be Used in Evaluating Time-Distributed Costs & Benefits".

Department of Defense Construction Criteria Manual DoD 4270.1-M.

Army Regulation AR 11-28, "Economic Analysis and Program Evaluation for Resource Management".

Environmental Protection Agency EPA Manual 430/9-78-009.