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TIME-PHASING COST ESTIMATES

PART II: FISCAL YEAR SPREADING OF MILITARY CONSTRUCTION COSTS

This report documents the results of an analysis conducted to develop a standardized method for spreading MILCON cost estimates by fiscal year across the DoD acquisition cycle. The MILCON budgeting process for the various Services was analyzed, and supplemented by Ballistic Missile Defense Organization (BMDO) requirements. Recommended fiscal year spreading factors for MILCON costs are addressed. The methodology has improved the credibility of BMDO MILCON cost estimates.

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**Fiscal Year Spreading of
Military Construction Costs
Interim Report**

(CDRL A332-7)

1 February 1993

Prepared for:

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Director, Cost Estimating and Analysis

The Strategic Defense Initiative Organization
The Pentagon
Washington, D.C. 20301-7100
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Fiscal Year Spreading of MILCON Costs

BACKGROUND

There is currently a need for a standardized methodology for spreading SDIO cost estimates by fiscal year. This study was initiated in October 1992 as part of a group of studies to improve methods for time-phasing SDIO Global Protection Against Limited Strike (GPALS) System Element cost estimates. More specifically, this effort was ventured to capture the Military Construction (MILCON) process for incorporation into a fiscal year spreading methodology.

PURPOSE

This report documents the results of an analysis conducted to develop a standardized method for spreading MILCON cost estimates by fiscal year across the defense system acquisition cycle. The results of this analysis are intended to serve as a basis for spreading estimated MILCON costs by fiscal year for SDIO GPALS System Element cost estimates.

APPROACH

The initial step in this analysis was to review regulations and directives associated with the MILCON process. U.S. Army and U.S. Air Force regulations, as well as SDIO directives were included as part of this review. Next, a review of U.S. Army and U.S. Air Force studies pertaining to the activities involved in the MILCON process was conducted. From this analysis, MILCON fiscal year spreading rules were developed. The results of the MILCON process analysis are documented in this report.

SCOPE

The MILCON process is the method for obtaining new facilities and major renovation projects for the military services and other DoD agencies.¹ MILCON appropriations are sources of

¹An Investigation of the Application of the Design/Build Method to Military Construction Program Projects, p.13, Thesis, Capt. Buckingham, AFTT (AU), 29 December 1989.

funds for the acquisition of new facilities and major additions or alterations to existing facilities, and include the purchase of land.²

In the U.S. Army, Military Construction, Army (MCA) program funds are used for facility construction costing over \$200,000. Minor Military Construction, Army (MMCA) funding is available for construction projects costing less than \$1,000,000 but more than \$200,000. However, Congressional notification is required for MMCA projects which cost greater than \$500,000. Operations and Maintenance, Army (OMA) funds are normally used for construction projects which cost less than \$200,000.³

In the U.S. Air Force, MILCON funding is used for facility construction costing more than \$1,000,000. Minor Construction funding is available for projects which cost at least \$200,000 but less than \$1,000,000. Construction projects costing less than \$200,000 are generally Operations & Maintenance funded.⁴

The two primary funding sources for facility construction projects for SDIO are generally categorized as MILCON, and Research, Development, Test and Evaluation (RDT&E). Military Construction appropriations are the primary source of funding for facility acquisitions with construction costs over \$300,000. RDT&E is a secondary source of SDIO real property facility construction. However, RDT&E projects: "[1] must be used to support a unique research effort, [2] cannot have general utility, or [3] may be consumed during test. Congressional notification is required before any RDT&E funds are authorized for facility construction over \$300,000. RDT&E projects below \$300,000 are reported to Congress as a regular submittal of the RD-4 report".⁵

SDIO facility construction projects which do not meet MILCON funding thresholds and are not classified as RDT&E projects may be Operations and Support (O&S) funded. By law, facility construction projects cannot be parsed into smaller projects in order to circumvent the rules which apply to a particular source of funding.

²Annual Request for SDI MILCON and RDT&E Real Property Facility Projects Documentation Memorandum, Col. Toole, SDIO, 31 January 1992.

³U.S. Army Regulation 415-15, 1 January 1984.

⁴U.S. Air Force, SAFFMB, 1990.

⁵Annual Request for SDI MILCON and RDT&E Real Property Facility Projects Documentation Memorandum, Col. Toole, SDIO, 31 January 1992.

For purposes of this report, only the primary process for facilities acquisition is analyzed, that which uses the MILCON appropriation for construction costs (normally over \$300,000 for SDIO). Facility acquisition costs which are not included in MILCON appropriations for activities such as requirements definition, siting analysis, environmental analysis, community impact plans, etc., are not included as part of this analysis.

ANALYSIS

The MILCON process is illustrated in Figure 1 along with cost allocations for Military Construction by fiscal year. Recommended fiscal year spreading factors for MILCON costs are included in Table 1. Cost allocations should be made beginning with the initial design year which occurs three years prior to the year of construction completion (C-3) through the year that Congressional approval is obtained and MILCON funding is received (C-1). Costs associated with requirements identification and programming submittals during year C-4 are considered Research, Development, Test, and Evaluation (RDT&E) costs, not MILCON costs.

The MILCON process consists of three interrelated phases, the first of which is the Programming Phase.^{6,7} The purpose of the Programming Phase is to perform analysis to determine project feasibility and to establish the major project parameters including requirements identification. A documented justification and a decision to proceed based upon criteria and procedures laid out by law are necessary to transition to the next phase which is the Design Phase.⁸

The Design Phase overlaps the Programming Phase because some preliminary design is necessary to support the decision making process, provide better estimates of funding needs, and refine project scope.⁹ This phase consists of the time spent in the preparation of design and

⁶An Investigation of the Application of the Design/Build Method to Military Construction Program Projects, p.13, Thesis, Capt. Buckingham, AFIT (AU), 29 December 1989.

⁷An Investigation Concerning Perceptions of Military Construction Program Effectiveness by the AFRCES, the MAJCOMS, and the Bases, p.8, Thesis, Capt. Dutcher, AFIT (AU), 26 November 1986.

⁸An Investigation of the Application of the Design/Build Method to Military Construction Program Projects, p.13, Thesis, Capt. Buckingham, AFIT (AU), 29 December 1989.

⁹Ibid.

MILCON

Phases/Cost Allocations

JB-121692-01
01/11/83

Completion Year	Phase/Activity	Cost Allocation
C-4	Requirements Identification	N/A
	Programming Phase Programming Submittals	
C-3	Pre-Design Activities	50% of Design \$
	Programming/Design Phase Begin Design	
C-2	35% Design Complete	50% of Design \$
	Design Phase Congressional Review/100% Design Complete	
C-1	Competition	100% of Construction \$ + Contingency \$ + SIOH \$
	Construction Phase Award Construct	
C-0	Construction Phase	N/A
	Complete Construction	

Note:

- Design - 10% of Construction \$
- Contingencies for New Projects - 5% of Construction \$
- Contingencies for Rehabilitation - 10% of Construction \$
- Sup. Insp. & Ovrhd. (SIOH) for CONUS - 5% of Construction \$
- Sup. Insp. & Ovrhd. (SIOH) for Overseas - 3.5% of Construction \$
- C-0 - Year Facility Construction is Completed

Figure 1

MILCON Fiscal Year Spreading 5 Year Cycle

Funding Source	Requirements Identification Yr 1 (C-4)	Design to 35% Funds Yr 2 (C-3)	100% Design Completion Funds Yr 3 (C-2)	Construction, Contingency, SIOH Funds Yr 4 (C-1)	Construction Completion Yr 5 (C-0)
MILCON		4%	4%	92%	

Note:

- (1) C-0 = Year facility construction is completed.
- (2) MILCON cost allocations should be applied to total combined costs for Design; Construction; Contingencies; and Supervision, Inspection, & Overhead (SIOH).
- (3) MILCON cost allocations based on following factors which utilize Construction costs as base in computations:
 - Design to 35% = 5% of Construction \$
 - 100% Design Completion = 5% of Construction \$
 - Contingencies:
 - New Projects = 5% of Construction \$
 - Rehabilitations = 10% of Construction \$
 - Supervision, Inspection, and Overhead:
 - CONUS = 6% of Construction \$
 - Overseas = 6.5% of Construction \$
- (4) Computations for MILCON cost allocation percentages have been rounded to nearest whole number.

Table 1

ISSUES

- Although rules for spreading MILCON costs for major programs are offered in this analysis, the development of fiscal year spreading rules for Minor Military Construction, RDT&E and O&S funds may also be desirable.
- Additional research should be conducted to insure that no costs related to Requirements Identification and Programming Submittals during the initial year of the Programming Phase are MILCON funded.
- The factors provided in Figure 1 for design, contingency, and SIOH costs were obtained directly from an SDIO guidance document which offered no statistical verification.¹⁶ Follow-up analysis should be conducted to determine whether these factors are statistically sound.
- MILCON design costs have been allocated evenly between the two years in which design is to occur, per SDIO guidance.¹⁷ Research of historical MILCON design profiles may be useful to make a better determination of the appropriate percentage of total costs to apply between the two years in which design occurs.

CONCLUSIONS

The MILCON fiscal year spreading rules developed in this analysis are based on sufficient data to be applied to major SDIO MILCON project cost estimates. These rules are based on SDIO guidance and therefore apply specifically to SDIO projects. They may require some adjustments if applied to non-SDIO related MILCON projects. The institution of this MILCON fiscal year spreading methodology across SDIO GPALS System Element cost estimates can improve the credibility of the manner in which costs are allocated by fiscal year. The results of this study should be refined as additional information becomes available.

¹⁶Annual Request for SDI MILCON and RDT&E Real Property Facility Projects Documentation Memorandum, Col. Toole, SDIO, 31 January 1992.

¹⁷Ibid.