A RAND NOTE

MULTIYEAR CONTRACTING FOR THE PRODUCTION OF DEFENSE SYSTEMS: A PRIMER

Edmund Dews, Michael D. Rich

February 1982

N-1804-AF

Prepared For

The United States Air Force

Rand
SANTA MONICA, CA. 90406

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PREFACE

An important element of most recent proposals for improving the major weapon-system acquisition process is a recommendation for wider use of multiyear contracting for production procurement. Numerous specific changes in policy and regulations have been proposed to implement that recommendation, and some of these changes are embodied in the Department of Defense Authorization Act, 1982, which became law at the beginning of December 1981.

The brief study reported on here had its origin in a request from several Air Staff General Officers who saw the need for a report on multiyear contracting that would put it in context with other funding-contracting modes, explain its rather abstruse terminology, describe the key issues relating to its wider use while avoiding advocacy, and thus provide a basis for management review and evaluation.

This Note is one response to that request. It was prepared as part of the Concept Development and Project Formulation project of the Project AIR FORCE Resource Management Program. It should be of interest to the procurement and financial management communities within the Department of Defense, the military Services, and the defense industry.

SUMMARY

This Note describes the concept of multiyear contracting in defense procurement, summarizes recent proposals and new legislation intended to widen its use and increase its utility, and outlines the criteria to be used in choosing the types of acquisitions best adapted to this mode of contracting. Its purpose is to describe and explain rather than to assess or advocate, and it emphasizes contracting for production--that is, for the procurement of end items not available off the shelf. Contracting for research and development follows different rules and is not addressed here.

Defense procurement normally proceeds by a series of annual steps. The annual defense appropriation act provides funding for the purchase of "requirements" as programmed year by year for the Five-Year Defense Plan. The funding for each procurement program is usually earmarked for the purchase of a single fiscal year's requirement, and the purchase is then accomplished by means of a single-year or "annual" contract calling for the production and delivery of the items in the year's requirement. The funding provided covers the amount required (or estimated to be required) to meet the Government's payments for the end items called for in the contract. The contract is therefore said to be "fully funded." Full funding is the general rule.

The production of military end items is thus normally procured by means of a series of annual contracts fully funded by annual appropriations. This is called *annual contracting*.

Annual contracting has some obvious advantages. It avoids the shifting of burdens to future Congresses that may not wish to accept them. It provides high visibility for high-cost items. It has considerable flexibility, providing yearly opportunities for changes in design, in production rate, and in procurement quantity, in response to changes in the threat, to the emergence of new technologies, or to budgetary pressures.

Annual contracting can also have some disadvantages. The short-term-commitment, year-by-year approach is not necessarily the most economical way to procure an item with a production run expected to extend over many years. For such an item, it is claimed, a contract with long-term commitments--a *multiyear contract*--would often be preferred. Broadly defined, a multiyear contract is simply a contract that provides for the procurement, in annual increments, of the requirements programmed for two or more successive years.

The main benefits claimed for the wider use of multiyear contracting are (1) lower procurement prices, (2) increased industrial productivity, and (3) a broadening of the defense industrial base. According to the proponents of multiyear contracting, these benefits should flow from the opportunities and encouragement provided by the multiyear commitment for more dependable long-term production planning, productivity-increasing front-end investments in plant and training, more stable production rates, economies of scale in the purchase of materials and components, and (possibly) increased competition among suppliers. The arguments for expanding the use of multiyear contracts may therefore be characterized as *efficiency and cost-saving* arguments.

The term "multiyear contract" is used in both a generic and a specific sense. In its generic sense it has the meaning just described; it is a contract for more than a single year's requirement. This is the sense in which it is used in the Department of Defense Authorization Act, 1982, signed into law at the beginning of December 1981.

For the last ten years or so, however, "multiyear contract" has been used almost exclusively in a specific sense defined in the Defense Acquisition Regulation (the DAR), which makes a distinction on the basis of the funding available for the multiyear buy. If funding for the complete multiyear buy is *not* available at the time of contract award, then the contract is a "multiyear contract" in the specific, DAR sense. In this sense, a multiyear contract is a contract for multiyear procurement that at the time of award relies in part on funding already available and in part on appropriations expected to be made in the future; that is, it is a contract sequentially funded by a series of annual

appropriations. Because each successive appropriation provides full funding for a fiscal year's end-item requirement, such procurements may also be regarded as full funded--*sequentially full funded.* A full front funded contract for multiyear procurement--which would not be a "multiyear contract" in the DAR sense of the term--would have the funding needed for all contract years already appropriated at the time of contract award.

For various reasons, multiyear contracts--whether full front funded or sequentially full funded--have not been widely used in recent years. For full front funded multiyear contracts, the principal roadblock appears to have been a perception that Congress would be reluctant to authorize the larger appropriations needed before contract award. For major systems, full front funding might create an awkward series of crests and troughs in the appropriations accounts, in some years requiring procurement appropriations many billions of dollars greater than in others.

For sequentially full funded multiyear contracts (SFMYCs), the roadblocks have derived from the reluctance of producers to accept such contracts because of the especially high risks imposed by statutory and regulatory restrictions. These restrictions on SFMYCs included (1) a $5 million ceiling on the reimbursement of contractor expenses in the event of contract cancellation, (2) a Government cancellation liability limited to the contractor's nonrecurring costs, and (3) a requirement that prices must be fixed and level for all items called for in the contract.

These restrictions placed much of the financial risk of contract cancellation on the contractor. If the Government canceled an SFMYC because funding was not made available for the next fiscal year in the contract sequence, the contractor might suffer substantial loss. The risk of loss would be especially serious for high-dollar contracts canceled early in the multiyear period if the contractor had made substantial front end expenditures on the recurring elements of production cost, or if there was difficulty in establishing the full extent of nonrecurring costs and "learning-curve" effects. These restrictions thus confined

the use of SFMYCs to low-dollar procurements and discouraged producers with SFMYCs from making productivity increasing investments in plant and training, and from buying materials in the more economic, multiyear, order quantities.

The proponents of multiyear contracting have generally sought to promote SFMYCs rather than full front funded multiyear contracts, because sequential funding was regarded as more acceptable to the Congress and because it seemed feasible to make SFMYCs acceptable to producers by means of simple statutory and regulatory changes. Of the three restrictions listed above, only the last remains as of the time of writing. The Department of Defense Authorization Act, 1982, has explicitly authorized the Secretary of Defense to write SFMYCs with cancellation ceilings of up to $100 million and with cancellation liabilities including both recurring and nonrecurring costs. The general authority given the Secretary to prescribe regulations to promote the use of multiyear contracts will presumably also result in modification of the requirement for fixed and level pricing.

The proponents of multiyear contracting have also sought wider use of *advance procurement*. Advance procurement contracts originated as a means of saving production time by ordering long lead time components even before the main contract was awarded for the production of the end item. A Department of Defense Directive of 1969 has confined the use of advance procurement to this specific objective, restricted its use to components, and discouraged its use for components costing more than a small fraction of end item cost.

The Defense Department Authorization Act, 1982, goes a long way toward liberalizing the use of advance procurement. It authorizes multiyear contracts for use in advance procurement, extends the scope of advance procurement contracts to include materials and parts as well as components, and expands the objectives of advance procurement to include more economical order quantities and more efficient production rates. In principle, therefore, advance procurement will now be available as a means of increasing productivity and lowering costs. It can thus supplement, and to some degree substitute for, the use of multiyear contracting for complete end items.

As a result of the new legislation, the Services will now be able to pursue a richer set of procurement objectives and in doing so to use a greater variety of funding-contracting modes. Annual contracts will presumably be used somewhat less frequently, being partly replaced by contracts for multiyear procurement sometimes full front funded but usually funded sequentially. SFMYCs will sometimes be used to buy major systems. Advance procurements will be multiyear as well as annual. Many different combinations of procurement and advance procurement contracts will be possible. These opportunities will present acquisition and financial managers with some challenging questions to be resolved.

Five key sets of issues can be identified:

- How will the DAR be revised to implement the broad guidelines provided in the new legislation and thus promote the use of multiyear and advance procurement contracting? The specifics will be critical in determining the distribution of financial risk among the various actors in the procurement process, and hence in motivating industry to make the front-end investments and other efficiency improving changes that are sought.

- Will the Secretary of Defense use his discretionary powers to abolish or modify the existing DAR requirement that sequentially funded multiyear contracts must call for fixed, level prices? If level pricing is no longer required, what kinds of pricing profiles can be substituted, and how will they relate to expected cost-quantity curves?

- To what extent can (and should) expanded advance procurement be used to substitute for end-item multiyear contracting? How should multiyear advance procurement be funded?

- How will multiyear contracting affect price competition among both prime contractors and subcontractors in the production of the items contracted for? How can effective competition be best achieved in multiyear procurement?

- How will suitable procurements be selected for multiyear contracting? How will the prescribed criteria be applied, and how will the risks of making poor choices be assessed and weighed against expected benefits? To what extent should multiyear contracting be used to enhance program stability as well as to exploit inherent stability?

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I. INTRODUCTION AND BACKGROUND

This Note describes the concept of multiyear contracting in defense procurement, summarizes recent proposals and new legislation intended to widen its use and increase its utility, and outlines the criteria to be used in choosing the types of acquisitions best adapted to this mode of contracting. Its purpose is to describe and explain rather than to assess or advocate. It necessarily alludes to some of the advantages and disadvantages ascribed to multiyear contracting, but it does not attempt a benefit-risk analysis.

In defense procurement, the term "multiyear contract" has been used in both a generic and a specific sense. In its generic sense, "multiyear contract" refers to any procurement* contract used to purchase more than a single fiscal year's requirement† of military items. Thus in its generic sense, a multiyear contract is simply a contract used for a multiyear procurement. This is the sense in which the term is used in the Department of Defense Authorization Act, 1982 (1 December 1981).

For the last ten years or so, however, "multiyear contract" has been used almost exclusively in a specific sense defined in the Defense Acquisition Regulation (the DAR).‡ The DAR definition (which may soon

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*"Procurement" contracts are concerned with the production and delivery of complete end items or the provision of certain services such as housing and logistics support. Contracting for Research, Development, Test, and Evaluation (RDT&E) is a different matter, follows different rules, and is not at issue in connection with multiyear contracting.

†A fiscal year's "requirement" of an item is the amount of that item programmed in the Five-Year Defense Plan (FYDP) to be procured "for" that year. It is basically a programming concept that reflects expected funding availability and interprogram competition for funds. Actual deliveries of hardware usually occur over time, with delivery of a given year's requirement sometimes lagging several fiscal years behind the fiscal year for which the procurement was programmed.

‡Formerly referred to as the Armed Services Procurement Regulation (the ASPR) and now sometimes referred to as the DAR (ASPR).

be changed) makes a distinction on the basis of the *funding* available to pay for the multiyear buy. If funding for the complete multiyear buy is *not* available at the time of contract award, then the contract is a "multiyear contract" in the specific, DAR sense.* In that sense, a multiyear contract is a contract for multiyear procurement that at the time of award relies in part on funding already available and in part on appropriations expected to be made in the future. If the funding made available at the time of contract award is sufficient to cover the estimated payments for *all* the years of the multiyear contract--that is, for every fiscal year's requirement of end items called for in the contract--then the contract is not a multiyear contract in the specific, DAR sense.

Funding up front sufficient to cover payments for all the years of a multiyear contract is one type of "full funding," as will be discussed later in more detail. Here it is convenient to describe such up-front funding as "full front funding." In Department of Defense terminology, the term "full funding" also refers to funding sufficient to cover the estimated costs of a single fiscal year's programmed requirement of end items, even if the future-year requirements in a contract are not yet funded. [2,3] Thus a multiyear contract can be funded by a series of annual appropriation acts each of which provides "full funding" for a single fiscal year's requirement. Here we will refer to such a funding arrangement as "sequential full funding" or (briefly) "sequential funding." Both full front funding and sequential full funding provide for the full (estimated) cost of procuring a stated number of complete end items. They can thus be described as "end-cost" funding. [4] They should be distinguished from funding that merely supports on-going work but that does not provide for the production of complete end items; in Department of Defense usage, the latter type of funding is usually referred to as "incremental funding." Incremental funding is used for most RDT&E contracts, but is nowadays almost never used for the procurement of defense systems. For procurement, Department of Defense policy calls for full funding in the end-cost sense.

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*The DAR defines multiyear contracting as "a method of acquiring for DoD planned requirements for up to a 5-year period . . . *without having total funds available at time of award.*" Ref. 1, emphasis added.

The use of the term "multiyear contract" in both a generic and a specific sense has been less confusing than one might think, because multiyear procurements have not been numerous during the last ten years; as will be discussed below, the normal procurement contract has been for a single year's requirements. Moreover, among multiyear procurements only a very small minority of contracts have had full front funding. Thus in practice, a contract for multiyear procurement has almost always been a multiyear contract in the specific, DAR sense of the term. And this is the sense in which the term has been used in recent years by the proponents of statutory and other reforms intended to expand the use of multiyear procurement; they wished to liberalize the rules governing the use of *sequentially funded* multiyear contracts, that is, contracts with sequential full funding.

The Department of Defense Authorization Act, 1982, goes a long way toward this liberalization. It also defines "multiyear contract" in the generic rather than the specific, DAR sense.* At the time of this writing, the consequences of this statutory definition must be regarded as somewhat speculative. One possible consequence is that some of the restrictions that apply to sequentially full funded multiyear contracts may now also apply to full front funded multiyear contracts.

For the time at least, the new statutory definition complicates discussion. The long-established DAR definition may be obsolete, whereas the extent to which the new definition applies remains to be established.

To avoid ambiguity in the discussion that follows, it will frequently be necessary to indicate whether the contract has full front funding or sequential full funding. For precision and brevity we introduce the following abbreviations:

FFMYC: a front-funded multiyear contract (one with full front funding).

SFMYC: a sequentially funded multiyear contract (one with sequential full funding).

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*A multiyear contract is defined by the Act as "a contract for the purchase of property or services for more than one, but not more than five, program years." The type of funding--whether full front funding or sequential--is not stipulated in the definition. (See Ref. 5.)

Because it has been the subject of many proposals for procurement reform, the SFMYC will be the focus of the discussion.

The SFMYC may be defined as a procurement contract used to purchase a stated total quantity of military supplies to be delivered in several successive annual increments in stated numbers at a stated price, even though the total funds ultimately required for the outyear payments are not immediately available (have not yet been appropriated by the Congress) at the time of contract award. Funds for an SFMYC are appropriated and obligated for the first year's quantity, with succeeding years' quantities to be funded through a succession of appropriations in the later years. If funds are not made avaialable for a succeeding year, the contract is canceled at that point.*

Before December 1981, the use of SFMYCs was narrowly limited by statutory and regulatory restrictions of a kind initially imposed at the beginning of the 1970s. Although later relaxed in some respects, the restrictions remained so limiting that during the last 10 years SFMYCs have been little used for the procurement of weapon and support systems, and almost never for the procurement of *major* systems.

The following have been the chief restrictions applying to SFMYCs:

1. A $5 million ceiling on reimbursement of contractor expenses in the event of cancellation.
2. Government cancellation liability limited to the contractor's nonrecurring costs.
3. Prices must be fixed† and level for all items called for in the contract.
4. Quantities must not exceed five years of "requirements" as programmed in the Five-Year Defense Plan, with each annual increment in the contract conforming to the number of items programmed for that year.

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*This description is based on the 1980 DAR. [1]

†Firm fixed prices or fixed prices with adjustments for inflation ("economic price adjustment").

When such restrictions were imposed it was probably recognized that SFMYCs would no longer be suitable for the procurement of complex, expensive items. For quite different reasons (to be described below), full front funded multiyear contracts (FFMYCs) were also regarded as generally unsuitable. The result was that multiyear contracts--however funded--played only a modest role in defense procurement during the 1970s.

Many proposals have been made for lifting or modifying the restrictions on SFMYCs so that this funding-contracting mode could be more widely used in defense procurement, and the Department of Defense Authorization Act, 1982, has now relaxed or removed some of these restrictions.

The main benefits claimed for the wider use of SFMYCs are (1) lower procurement prices, (2) increased industrial productivity, and (3) a broadening of the defense industrial base. These benefits are expected to flow from the opportunities afforded and encouragement given by multiyear procurement* for more dependable long-term production planning, productivity-increasing front-end investments in plant and training, stabler production rates, economies of scale in the purchase of materials and components, and (possibly) increased competition among suppliers. The arguments for expanding the use of SFMYCs may therefore be broadly characterized as *efficiency and cost-saving* arguments.

The proponents of multiyear procurement do not hold it out as a panacea for the problems of defense production and procurement or as a technique to be adopted without supporting measures. Often the proposals for expanded multiyear procurement are accompanied by interconnected suggestions or recommendations concerning the Planning, Programming, and Budgeting System, the stockpiling of strategic materials, the depreciation rates for new capital investments, the provision of direct Government support for plant modernization, the scope of allowable costs in defense production, the contractor's cash flow and cost of borrowing, and the contractual treatment of inflation as an element in product pricing, to

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*The same benefits might be claimed for both SFMYCs and FFMYCs, but the proposals for procurement reform have generally emphasized SFMYCs.

name only some of the related considerations. However, although greater use of multiyear procurement is often only one element in a set of proposed procurement reforms, its proponents usually agree that it should play a key role.

During the 1960s SFMYCs were one of the funding contracting modes routinely available if not typically used in system procurement. Later, restrictions on SFMYC use were introduced partly because of disillusionment with Total Package Procurement (which had often used SFMYCs), and partly because of Congress's desire to avoid the large cancellation charges that, under previous rules, could become payable if major-system SFMYCs were to be canceled. When cancellation of a Navy SFMYC for helicopter carriers generated a contractor's claim for $110 million, the House Armed Services Committee objected that contracts allowing such cancellation claims could bind the Government to pay huge sums for which appropriations had not been made. As a result, in the FY 1973 defense authorization, the Congress imposed a ceiling of $1 million on the cancellation charges allowable in future SFMYCs.

Although Congress increased the maximum cancellation charge to $5 million three years later, the limit was still so low that it ruled out SFMYCs for the production of major defense systems; $5 million was almost always too little--usually far too little--to cover the expenses a contractor incurred in preparing for future-year production of major hardware items. The risk of cancellation with the resulting loss due to unreimbursed expenses was too great for contractors to accept.*

In principle the SFMYC remained an authorized funding-contracting mode during the 1970s, but in practice it was limited to a modest number of procurements, almost always of the kind where the contractor's unrecovered costs would be unlikely to exceed the low cancellation ceiling in the event of contract cancellation. Again in principle, it was possible to seek Congressional approval for higher cancellation ceilings

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*Another reason why SFMYCs were almost never used for major-system procurements in the 1970s was a provision in the DAR requiring all SFMYCs to be awarded on a price-competitive basis. But it is usually infeasible to qualify more than one producer of a major system, so such systems can seldom be procured on that basis. This requirement for price competition in SFMYC awards was removed in 1977.

in specific cases; but the mood of the Congress appeared to be unsympathetic to requests of this kind, and few were made.

Recently, however, interest in multiyear procurement has revived, and proposals have been made for the expanded use of SFMYCs, especially for the procurement of hardware items of high unit or total program cost such as aircraft or missiles, where the use of SFMYCs has been most severely constrained by statute and regulation. The General Accounting Office [6] and the Defense Science Board [7] reported in its favor. The Panel on Industrial Preparedness of the House Armed Services Committee held extensive hearings during which General Alton D. Slay (then Commander of the Air Force Systems Command) and a large group of industrial leaders unanimously recommended the increased use of SFMYCs, [8] a recommendation the Panel strongly endorsed in its own report. [9] Subsequently, defense authorization bills in both the House [10] and the Senate [11] included words aimed at reducing the restrictions on SFMYCs and encouraging their greater use. These bills were supported by Secretary of Defense Caspar W. Weinberger, [12] who, with Deputy Secretary Frank C. Carlucci and Under Secretary Richard D. DeLauer, adopted multiyear procurement as one of the major Department of Defense initiatives for improving the acquisition process. [13,14, 15,16] When the present Note was first drafted, the House and Senate authorization bills had just been passed by their respective houses and differences were being reconciled by the House-Senate committee of conference. The conference report favored the House position on SFMYCs, giving strong support for the expanded use of such contracts and raising the cancellation ceiling to $100 million. [17] The Department of Defense Authorization Act, 1982, which embodied this provision, has just become law. [5] It appears likely, therefore, that SFMYCs will be adopted in the future for an increased share of defense procurements, including the procurement of some major systems.

In what follows, Section II describes the basic funding-contracting modes, comparing sequentially full funded multiyear contracts with full front funded multiyear contracts and the normal annual contracts. The related concept of "advance procurement" is also described. The recently proposed changes in the rules for the use of SFMYCs and advance procurement are then outlined in Section III, together with the relevant

provisions of the FY 1982 Defense Authorization and Appropriation Acts. Section IV identifies the main issues of choice in taking advantage of the opportunities provided by the new legislation.

The reader is assumed to have a basic knowledge of the budgeting and authorization-appropriation process. Some of the terms used here may be unfamiliar, however, or used in a specialized way, and the discussion therefore embodies a number of definitions. This is especially necessary because of some confusion about the meanings of some terms arising from differences in usage between the Defense Department and other Government agencies. Appendix A reproduces the definitions relating to multiyear procurement that were adopted by the Deputy Secretary of Defense in a May 1981 memorandum. [14] The definitions in Appendix A may be usefully referred to from time to time, but they were written in a period of transition, and it can be expected that the Department of Defense will soon replace them with a more comprehensive and up-to-date glossary. The reader may also wish to refer to the *Glossary of Terms Used in the Federal Budget Process*, published by the General Accounting Office, March 1981. [18]

II. BASIC FUNDING-CONTRACTING MODES

ACCOMMODATING PROCUREMENT TO PRODUCTION OVER TIME

Military equipment can seldom be supplied immediately from a contractor's existing stock. Typically it is developed to meet a specific Service requirement and then manufactured to special order, with production and deliveries occurring over time, often over many years. Funding-contracting modes that recognize the need to accommodate defense procurements to production over time have been evolved for funding those procurements, for contracting with producers, and for paying the contractors. The sequentially funded multiyear contract is one such mode, and it is best understood in the context of other modes. To provide this context is the purpose of this Section. The topics to be discussed include:

- Multiple-year appropriations, allowing funds to be obligated and expenditures made over more than a single year.
- Annual procurement contracts, which provide for only a single year's requirement.
- Contracts for the procurement of several years' requirements, either full front funded (FFMYCs) or sequentially full funded (SFMYCs).
- Contract termination or cancellation, to provide for changes in demand over time.
- Progress payments during the course of production.
- Advance procurement--a mode of partial procurement originally introduced to save production time.

In a comparison of SFMYCs with other funding-contracting modes, the two variables of interest are (1) the contract's share of the total buy programmed in the Five-Year Defense Plan (one year's *or* several years'

"slice" of the total); and (2) the contract's funding (full front funded, *or* sequentially full funded, requiring successive appropriations over several years).

ANNUAL PROCUREMENT CONTRACTS (THE NORMAL MODE)

The simplest situation occurs when the Government needs only a single year's supply of an end item (a single year's "requirement") and that supply can be produced (or bought off the shelf), delivered, and paid for within a single fiscal year. The Congress authorizes its purchase in an authorization act and appropriates all the funds needed in an appropriation act.* This appropriation provides budget authority to obligate the Government to pay for the end item by entering into a contract for its delivery. Soon after it is delivered, it is paid for. In the very simple case described here, the appropriation is a single-year or annual appropriation and the contract is a single-year or annual contract that procures a single year's requirement. Contract performance is completed and payment made within the year for which the appropriation is made. The single-year appropriation provides all the funds needed to pay for the end items called for in the contract. Because the full, estimated end-item cost is covered, the procurement is fully funded.

Usually, however, the procurement of a single year's requirement of defense system end items takes more than a single year to complete all the activities involved in contracting, production, and payment. To accommodate to this time span, funds for a single year's requirement are normally made available for use over a longer period than the fiscal year for which they are appropriated. This is illustrated in the following tabulation:

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*The authorization act authorizes procurements on the condition that the obligation of funds for those procurements is authorized in an appropriation act. Thus "funding" at the Congressional level is the result of a two-step process and involves four key committees: the House and Senate Armed Services Committees (for authorization bills) and the House and Senate Appropriations Committees (for appropriation bills).

Type of Procurement Appropriation	Period for Which Funds Are Available: For Obligation (years)	Period for Which Funds Are Available: For Payment (years)
Single-year appropriation	1	3
Multiple-year appropriation		
2-year	2	4
3-year	3	5
N-year	N	N + 2
"No-year" appropriation	No limit	No limit

Thus a three-year procurement appropriation, such as is usual for the procurement of aircraft and other defense systems, provides budget authority for the corresponding obligations to be entered into over a period of three years (that is, during the fiscal year for which the appropriation is made and the two succeeding years), and for payments to be made in those three years and the two succeeding years (five years in all). For some U.S. Navy ships, multiple-year appropriations provide funding availability for even longer periods.

Multiple-year procurement appropriations are sometimes referred to as "multiple-year funding." This is understandable, but the latter term is easily confused with "multiyear funding." The two are very different. *A multiple-year procurement appropriation is an appropriation for a single year's requirement*, whereas multiyear funding refers to appropriations covering more than a single year's requirement (see Appendix A). A multiple year appropriation would thus be appropriate for an annual (single-year) contract or for a single year's requirement called for in a sequentially funded multiyear contract. Multiyear funding would be appropriate for a full front funded multiyear contract.

Long production runs are normal in defense procurements. To produce the full buy of items such as aircraft, missiles, and tanks usually takes many years, typically five to ten years and sometimes longer. At present, most such buys, especially those with high dollar aggregates, are divided into single-year or "annual" increments *with a separate contract for each*

increment.* Each annual contract calls for complete end items, and is funded to cover the cost of these end items (is fully funded), usually with a multiple-year appropriation. Thus the total buy is achieved by means of a series of successive annual procurement contracts funded by a corresponding series of annual appropriation acts. This is often referred to as "annual contracting" and is the normal funding-contracting mode for defense procurement.

Leaving aside the efficiency and cost issues raised by the proponents of multiyear contracting, one can see obvious advantages to procurement through annual contracts fully funded by annual appropriations. Such procurement avoids the shifting of burdens to future Congresses that may not wish to accept them. It provides high visibility for high-cost items. It has considerable flexibility, providing yearly opportunities for changes in design, in production rate, and in procurement quantity, in response to changes in the threat, to the emergence of new technologies, or to budgetary pressures.

This mode of procurement is now so typical of U.S. practice† that it has become normal to think not only in terms of annual budget requests and annual contracting but also in terms of annual procurement "needs" or "requirements." But for most weapon systems the annual requirement is essentially a programming device for incrementally achieving the total requirement--the total number of items to be procured over the whole period of production. For most procurements, the opportunities for production efficiency and cost savings are more apparent when the requirement is viewed in terms of this all-year aggregate rather than in terms of a single year's increment. This long-term view of investment strategy is the one emphasized by the proponents of multiyear procurement.

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*Or, if there are two or more prime contractors, with a separate contract for each increment for each contractor. When a contract provides for production "options" for future-year increments, the Government's taking up of each option in turn is the equivalent of a separate annual contract for each increment.

†But not procurement practice elsewhere. For example, single contracts calling for the whole or a major part of multiyear production runs are common in many NATO countries.

MULTIYEAR PROCUREMENT CONTRACTS: TWO BASIC FUNDING OPTIONS

As discussed earlier, a contract for the procurement of more than a single year's requirement may be either (1) full front funded in a single appropriation (the FFMYC), or (2) sequentially full funded for successive years, each appropriation being for a single year's buy (the SFMYC).* Sequential funding as just defined differs significantly from "incremental" funding. In Department of Defense usage, the latter term usually refers to funding *not* tied to the procurement of end items, for example, funding that provides for periodic payments for work done, however incomplete the output, as in research and development. Sequential funding, on the other hand, provides for payments for the production of annual increments of complete end items.

Table 1 schematically illustrates the two funding options for multiyear procurement and compares them with the normal mode of procurement by means of annually funded annual contracts.

The Full Front Funded Multiyear Contract (FFMYC)

The rarely used FFMYC is a single contract for more than one year's "requirement" with funding at the time of contract award sufficient for all annual increments of the multiyear buy. Compared with a series of annual contracts, the FFMYC would in principle provide the same opportunities as the SFMYC for increased production efficiency and cost savings. Indeed, the FFMYC might provide even greater opportunities if the full funding up front made it possible to order components and materials even more economically and to produce the end item at a more efficient production rate.

From the point of view of production efficiency, the ideal situation is one in which the program manager is free to purchase the authorized multiyear buy at the most economical rate consistent with the rate at which his Service can efficiently accept deliveries, taking into account the availability of Service facilities, trained personnel, and so on. Whether this freedom is available depends in part on the nature of the

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*These are the two basic options, but there are variants. For example, funding for a multiyear procurement may be sequential but the funds for each successive year may also provide for liabilities arising if the multiyear contract is terminated or canceled.

Table 1

COMPARISON OF FUNDING-CONTRACTING MODES

Funding-Contracting Mode	Fiscal Year for Which the Requirement Is Programmed for Procurement[a]					Remarks
	FY-1	FY-2	FY-3	FY-4	FY-5	
Single-year procurement: annual contracts[b]						
Successive annual contracts each for one year's "requirement," with each contract in turn fully funded by a separate annual appropriation.						The mode usually used. Fully funded.
FY for which contract funded:	FY-1	FY-2	FY-3	FY-4	FY-5	
FY when contract awarded:[c]	FY-1	FY-2	FY-3	FY-4	FY-5	
Multiyear procurement: sequentially full funded multiyear contracts (SFMYCs)						
A single contract for more than one year's "requirement" with each annual increment of the multiyear buy fully funded in turn by a separate annual appropriation.						The mode for which greater use has been sought. Until December 1981 the phrase "multiyear contract" was usually restricted to this mode. Sequentially full funded.
FY for which contract funded:	FY-1	FY-2	FY-3	FY-4	FY-5	
FY when contract awarded:[c]	FY-1	FY-1 contract calls for whole buy				
Multiyear procurement: full front funded multiyear contracts (FFMYCs)						
A single contract for more than one year's "requirement" with funding at the time of contract award sufficient for all annual increments of the multiyear buy.[d]						A mode possible but seldom used. Since December 1981 included within the statutory definition of "multiyear contract." Full front funded.
FY for which contract funded:	FY-1	Funded in FY-1 appropriation act				
FY when contract awarded:[c]	FY-1	FY-1 contract calls for whole buy				

[a] We assume here that an annual requirement for an item has been programmed for each of five successive fiscal years.

[b] "Single-year procurement" does not imply single-year appropriations. Most purchases of defense equipment are funded by means of multiple-year appropriations (typically three-year appropriations) so as to give a Service time to contract for production of the program-year "requirement" and the supplier time to produce the items contracted for (see p. 11).

[c] For simplicity, contract awards are shown here as being made in the first year for which contract funds are made available. With multiyear appropriations, however, awards can lag a year or more behind the fiscal year for which the appropriation is made (see p. 11).

[d] Several types of funding could be used here, including "no-year" appropriations (available until used) and "multiyear funding" (see Appendix A).

appropriation. The greatest freedom would occur when the front end funding is not earmarked for specific procurement quantities programmed year by year, but rather is provided *en bloc* to pay for the aggregate multiyear buy, with authority to obligate and expend the appropriated funds according to the most efficient production-and-acceptance schedule. This approach, if at all widely applied, would imply a major change in the current way budget requests are made and procurements and appropriations are authorized. Nowadays, funding--including multiyear funding--is usually appropriated in amounts tied to specific procurement quantities programmed year by year. Thus even with full funding up front the production rate is likely to be largely predetermined by a combination of programming and appropriation decisions, and these decisions could well be the same whether the multiyear contract is full front funded or sequentially full funded. Nonetheless, program managers and contractors would probably prefer full front funding over sequential funding if only because the former might imply a firmer Government commitment to completing the full procurement contracted for.

From the viewpoint of fiscal management, however, and particularly with the realities of interprogram budget competition and the need for cross-program, interyear budget flexibility in view, the full front funding of a major multiyear procurement could present serious problems:

1. It could require *very* large appropriations at the beginning of a major-system procurement--appropriations that the Congress might be reluctant to make.

2. If widely adopted for major systems, it could at the beginning greatly enlarge the "bow wave" in the procurement appropriations accounts (the "full funding bow wave"), and this might well be followed by an awkward series of sharp troughs and crests in subsequent-year budget requests and appropriations.*

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*The large approprations at the beginning of a major-system procurement, and the initial full funding bow wave aggregated over all procurements, are often referred to as a principal objection to the full front funding approach to multiyear contracting. However, this objection may have been exaggerated. Conceivably, full funding might be achieved by

3. If such a contract were to be discontinued by the Government well before completion, this might create a large pool of appropriated funds for which no Congressionally authorized use existed.

4. Discontinuance might also involve quite large payments to the contractor to cover expenses incurred earlier in preparing for the production activity that was subsequently discontinued.

5. It would fence in funds, increasing the stability of the programs for which it was used but reducing year-to-year cross-program financial flexibility and thus probably decreasing the stability of programs funded annually or sequentially.

In the face of such problems for financial management, it is not surprising that FFMYCs have been little used, however attractive they might appear from the point of view of a program manager seeking firm commitment and production efficiency.

The Sequentially Full Funded Multiyear Contract (SFMYC)

The SFMYC may be regarded as a funding-contracting mode that seeks to obtain the advantages of the FFMYC without its most serious

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means of "advance appropriations" providing budget authority earmarked for a series of future fiscal years. In this way, the amounts for the future fiscal years would not be included in the budget totals for the initial fiscal year for which the appropriation act was passed. [18, p. 31] This might have the effect, however, of committing future Congresses. Another approach would be to introduce full front funding gradually while scheduling major-system acquisition milestones so as to distribute new production starts more evenly over the years. The latter step would probably involve difficult cross-program decisions, but these may be necessary in any case; see Ref. 19 for a description of the serious problems that arise when a Service's major-system procurement starts are concentrated in time.

It is also sometimes objected that full front funding of multiyear contracts would result in a bow wave of *outlays* as well as of appropriations. This might or might not be the result. Changes in the outlay schedule for a given procurement (that is, changes from the schedule that would have prevailed with an annual contract or an SFMYC) would depend on the extent to which full front funding of the multiyear contract was accompanied by changes in the production schedule--for example, an increase in production rate and an earlier completion of the total buy. Full front funding by itself need not imply any significant change in the schedule of outlays.

disadvantages.* Or, to put it another way, SFMYCs represent an attempt to secure (1) the production efficiencies and cost savings expected from multiyear procurement as a result of economies of scale and more predictable demand, together with (2) the more limited financial commitment of the buyer and the greater opportunities for sequential decision-making provided by the annual contract. The SFMYC embodies a compromise. The compromise under the SFMYC rules of the 1970s favored the second set of objectives, with the result that SFMYCs were seldom acceptable to contractors except for low-dollar contracts. Large SFMYCs were perceived by contractors as financially "too risky." *The redistribution of financial risk between the buyer and the producer has been central in the proposals for expanded use of SFMYCs.*

From the producer's viewpoint, probably the major objection to SFMYCs in their 1970s form has been the limit on cancellation charges already mentioned. But that was not the only cause of concern. Several features of the SFMYC rules combined to translate uncertainties about the future into substantial financial risks for the contractor, especially for high-dollar contracts of long duration.

Cancellation Ceilings and Types of Allowable Charges. When an annual contract is discontinued for the convenience of the Government, it is "terminated." *Termination* may apply to the total quantity called for in the annual contract or to any lesser quantity. When an annual contract is terminated, follow-on production in later years can be arranged through new annual contracts. Annual contracting with the option of termination for Government convenience thus provides the Government buyer with great flexibility. The ceiling on termination charges is set by the cost of contract performance, [20] and as this is fully funded, the buyer avoids the risk that unfunded liabilities could be generated by a termination action. The termination charges allowed for the contractor's unrecovered costs can therefore be fairly

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*Of the five disadvantages ascribed above to FFMYCs, the first three would presumably be avoided or much reduced by sequential funding.

comprehensive.* There is a contractual limit on the amount of termination charges the contractor can claim, but no fixed, dollar, statutory ceiling.

From the contractor's point of view, the annual contract allows him to limit his own risks. He needs to make commitments only for short time spans. The allowable termination charges include recurring as well as nonrecurring costs; and, in particular, they may include claims arising from the purchase of raw materials, components, and subsystems.

For an SFMYC the situation is somewhat different. Termination (with the same allowable charges) is still possible, but it is limited to the production for a funded year of the multiyear contract. When funding is not made available for a subsequent year's requirement, the SFMYC is "canceled" at that point. *Cancellation* (an action apparently† unique to SFMYCs) applies to all the production for all the program years following the last funded year of the contract. Moreover, cancellation brings into play a statutory ceiling on the contractor's claim for reimbursement of unrecovered costs for the canceled years. Before December 1981, when it was raised to $100 million by the DoD Authorization Act, 1982, the ceiling was $5 million--a figure clearly low enough to protect the Government against any "large" unfunded liabilities. The statutory ceiling may now be exceeded only after notice to the Congress; [5] formerly, explicit Congressional approval was required. [21] Within the cancellation ceiling of $5 million, the Government's liability was further limited to the contractor's *nonrecurring* expenses (such as preproduction or startup costs and labor training) prorated for the canceled years of the contract;

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*The producer's unrecovered costs are the principal basis for his claim for reimbursement when a contract is discontinued, but not all cost components are allowable in such claims (interest charges, for example, are not), and those that are allowable depend on the type of contract. In general terms, "unrecovered" costs include all the costs incurred by the producer in fulfilling the contract but, because of contract termination or cancellation, not recouped in progress payments and payments for delivered items.

†We say "apparently" because cancellation as defined in the DAR appears to be inappropriate for any full front funded contract. The language in the DoD Authorization Act, 1982, is somewhat ambiguous, but the general thrust suggests that its authors expected "cancellation" to be applicable only to SFMYCs, not FFMYCs.

the contractor's recurring expenses incurred in anticipation of the canceled years' production were excluded from his allowable claims. [22]

The $5 million ceiling was a dominating limitation for any contract other than one of low value.* But within that ceiling the exclusion of liability for the contractor's recurring costs was also quite significant. In the absence of protection against losses for expenditures on recurring costs, the contractor was motivated to avoid front end expenditures on materials and components that would pay off only if outyear production continued without contract cancellation. Or, to put it another way, the contractor would purchase materials and components in the larger,† economic order quantities (EOQs) only at his own risk. The DoD Authorization Act, 1982, now specifically allows reimbursement of recurring costs--a change that should have important consequences.

Level Unit Pricing. A related restriction derives from the pricing pattern required in SFMYCs. The general rule given in the DAR is that a single fixed unit price should be established for every unit to be produced under an SFMYC--the same price, that is, for every unit in the total buy, regardless of the year of production.‡ Unlike cancellation ceilings and types of allowable costs, fixed, level pricing was not specifically addressed by the DoD Authorization Act, 1982.

This policy of fixed, level pricing was adopted some years ago when more effective price competition among prospective producers was a primary objective of SFMYC use. The rationale seems to have been that fixed, level pricing would "lock in" the bid price, thus

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*Because the contractor's unrecovered costs due to cancellation can typically amount to something like 1/6 to 1/3 of the aggregate value of a multiyear contract, contracts larger than $15 to $30 million probably appeared risky to a contractor even if he could expect reimbursement for *all* his unrecovered costs up to the $5 million ceiling.

†Usually larger than needed for production of a single year's requirement.

‡The level price may, however, be adjusted for inflation. An exception to the requirement for level pricing has sometimes been made in contracts with options that allow the buyer to make year-to-year decisions about the outyear purchases. In these, each year of the multiyear buy has been separately priced.

discouraging buy-ins* and securing for the buyer the advantage of a competitive price for the full period of the multiyear contract. To achieve this, however, it would not be necessary to specify more than a fixed price *schedule*, with unit price called out as a function of quantity produced. To require *level* pricing over the whole multiyear procurement seems to have been an overspecification, with two potentially adverse consequences.

First, it means that nonrecurring production costs must be amortized over the entire duration of the contract. The result is that a contractor is discouraged from making front end investments to improve productivity because full recovery of the investment costs is delayed until the outyears of the contract and becomes problematical if the contract is canceled.

The *second* consequence of level pricing derives from the typical "progress curve" describing the cost-quantity relationship.† Even in the absence of larger front end purchases of materials and components, and even without special front end investment in plant, because of the cost-quantity relationship a price averaged over the whole of a long production run could be well below production cost in the early years of the contract. But cancellation claims involving progress-curve effects (both prime contractor *and subcontractor* "learning"), while apparently allowable in principle,‡ may be difficult to establish, especially in the fixed-price contracts that are required for SFMYCs.

With such an array of restrictions, it is not surprising that SFMYCs have been little used in recent years, and then almost always for low-dollar procurements where the contractor faced only small losses in the event of cancellation.

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*Buying in is a strategy in which a competing producer makes an unrealistically low bid (or even accepts a loss) for an initial sale quantity in the expectation that he will be able to negotiate subsequent sales at advantageous prices on something like a sole-source basis.

†The progress curve describes the decline in production costs, especially labor costs, as production experience or "learning" accumulates. The decline is usually rapid at the beginning of production, with the result that the first year of production is normally one of high costs for the producer.

‡Ref. 20, Section 7-104.47.

PROGRESS PAYMENTS

If the Government withholds payment until an end item is delivered, the producer would have to finance the whole cost of its production.* For expensive systems with long production times, producer financing of the whole pre-delivery cost of producing an item would often create severe cash-flow problems for the producer and would be especially burdensome in a period of high interest rates. Even for less complex systems, producer financing could create problems sufficient to deter many firms, particularly smaller ones, from entering or remaining in the defense industrial base. Thus, whatever the funding-contracting mode, contracts for defense production almost always provide for interim or "progress" payments to be made to the contractor as work is accomplished. Such payments accommodate to production time by allowing substantial reimbursement of producer costs before the delivery of complete end items.

Because they reduce the need for the contractor to borrow,† progress payments make it easier for him to make productivity increasing investments up front. Thus a generous schedule of progress payments can reinforce, or in part substitute for, the investment incentives expected from multiyear procurement.

The recent trend has been to increase the share of producer-incurred costs paid for by the Government through progress payments. Such payments are now normally 85 to 95 percent in fixed-price contracts,‡ 100 percent in cost-reimbursement contracts, and up to 100 percent in fixed-price contracts with provisions for "unusual" progress payments or "milestone billings."

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*Exceptions would be components or subsystems provided as Government-furnished equipment or the free or subsidized use of Government-owned manufacturing facilities.

†Interest is not a production expense explicitly chargeable against a defense procurement contract.

‡Standard progress payments are 95 percent for small business firms and 90 percent for other firms. For "flexible" progress payments, the policy is that the contractor should retain at least a 5 percent investment in work in process. [23]

ADVANCE PROCUREMENT

Historically, contracts for "advance procurement" emerged as a method for accommodating to time by recognizing that a contractor could deliver complete end items sooner if certain *long lead time components* were ordered in a fiscal year earlier than that in which the contract was awarded for procurement of the end items themselves. An advance procurement contract was thus a precursor contract, closely related to, but usually separate from, the main procurement contract that called for complete end items.

In principle, advance procurement could be used with any type of main contract, annual or multiyear, but because annual contracts have been the norm, advance procurement has developed mainly as an adjunct to annual contracting. A series of annual complete-end-item contracts might thus be accompanied by a series of annual advance procurement contracts, each advance procurement contract preceding the related complete-end-item contract and supporting it with a year's "requirement" of components.

In principle, too, an advance procurement contract could be a multiyear contract (full front funded or sequentially funded), although DoD Directive 7200.4 [2] apparently discouraged this practice, except possibly in connection with an appropriately time-lagged multiyear contract for production of the complete end item. Thus the advance procurement contract has usually been an annual contract for production of selected components, preceding and supporting a related annual contract for production of complete end items.*

Advance procurement is an exception to the rule that a procurement contract should call for the delivery of complete items. In effect, the funds obligated when an annual advance procurement contract is awarded represent a partial advance against the total funding

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*The "contract" calling for the advance procurement of inputs to be used in the production of end items for a given fiscal year's requirement might simply take the form of a clause in a "main" contract for an earlier annual increment of end items.

required to purchase the complete end items called for in the main annual contract--a contract yet to be awarded and, in most instances, not yet funded. For this reason, even if the relevant appropriation is fully adequate to cover the payments due under the advance procurement contract, the advance procurement is regarded as an exception to the full funding rule as well as to the rule that a procurement contract should call for complete end items.

Because it was seen as an exception to these two procurement rules, attempts were made to restrict the use of advance procurement. According to the DoD Directive on full funding, [2] only long lead time components could be contracted for in this way. Moreover, to be eligible for advance procurement a component had to be capable of some use as an end item or spare part,* and the cost of the component could not exceed more than a small (though unstated) fraction of the cost of the complete end item to which it was an input. Nonetheless, advance procurement has been taking up a growing share of the procurement appropriations.

One reason for this growth has been an increase in the number and variety of long lead time items truly needed for timely production.† Another reason (perhaps influencing decisions at the margin) may have been the perception that components and other inputs for which the price is especially sensitive to production rate or order quantity could be obtained more cheaply if broken out from the main annual contract and purchased in increased quantity under an advance procurement contract. According to this view, advance procurement can both reinforce multiyear procurement and to some extent substitute for it.

For this and other reasons, an expansion in the authorized scope of advance procurement has been one of the objectives sought by the proponents of multiyear contracting.

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*Radios for use in army tanks would be an example.

†In November 1980 the Department of Defense made special provision for aircraft programs and permitted the advance procurement of some long lead time items other than components; these additional items included forgings, castings, and critical materials.

A WORD ON THE DEFINITION OF "FULL FUNDING"

The definition of procurement full funding adopted here is the one widely used in the Department of Defense. In this definition, the focus is on funding the cost of a *fiscal year's requirement* of end items. When the cost (or estimated cost) of the year's installment of end items is fully provided for in the appropriation for that year, the procurement is fully funded. A multiyear procurement can be fully funded up front in the year of contract initiation with a single appropriation large enough to pay for each and every annual increment of end items called for in the contract--what we have called "full front funding." Or it can be fully funded year by year by successive appropriations, each appropriation sufficient to pay for one year's requirement--what we have called "sequential full funding."

There is general agreement, inside and outside the Department of Defense, that the former is "full funding." But there is some uncertainty or confusion about whether the latter should be so described, and this has led to misunderstandings. In 1978, the Chairman of the House Budget Committee's Task Force on Budget Process observed that "full funding is a term with shades of different meanings and . . . agencies refer to their programs as fully funded under a variety of circumstances." [24]

In his response to this comment, the Comptroller General was more pointed: there was (he wrote) a generally accepted definition in use by the civil agencies of the Government, and there was *a different definition in use by the Department of Defense*. [25] The civil agencies focused on a whole program, not just on the requirements of a single year, and they used "full funding" to describe only those situations in which budget authority is requested and made available for the total cost of the program in the year in which the program is initiated. In other words, the civil agencies limited "full funding" to the situation we have described as "full front funding." The Comptroller General preferred the definition used by the civil agencies, but "this does not mean that the procedures followed by DoD are inappropriate." [25]

The generally authoritative glossary published by the General Accounting Office in 1981 adheres to the civil definition: "Full funding provides budgetary resources to cover the total cost of a program or project at the

time it is undertaken." According to the glossary, the alternative to full funding is "incremental funding," which provides for "only a portion of total estimated obligations" incurred in the fiscal year. [18]

Thus according to the GAO definitions, a sequentially funded multiyear contract (one funded initially for only a one-year increment of the total number of end items the Government obligated itself to buy) would not be regarded as fully funded; it would be "incrementally funded." According to Defense usage, on the other hand, such a procurement would be fully funded. The Defense definition involves the paradox that a contract that is awarded "without having total funds available at the time of award" [1] can still be the instrument of a "fully funded" procurement.

This difference between the Defense and the civil definitions provides two opportunities for misunderstanding. The Office of Management and Budget in its Circular A-11 requires that budget submissions by executive departments "will provide for *full funding* of the entire cost" of major procurement programs,* but the precise meaning of "full funding" and "entire cost" is not made clear. Nor are these terms explained in the companion OMB Circular A-34, which provides instructions on budget execution. [27] Thus there can be misunderstanding as to whether sequentially funded multiyear contracts are in compliance with the full-funding mandate of OMB Circular A-11.

The second opportunity for misunderstanding arises because of the possibility that sequentially funded multiyear contracts may be viewed as suffering from the same problems that "incrementally funded" procurements sometimes suffered from in the 1950s and early 1960s. Then funding-contracting arrangements often failed to provide for procurement of complete end items, and the Service (or Congress) sometimes had to choose between writing off an investment that had produced unfinished (and hence useless) items, or making additional resources available in the outyears to bring the unfinished items to completion.† Such problems are not

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*Ref. 26. The italics are in the original.

†Ref. 24, especially pages 6-8.

likely to arise today under the Defense Department's policy of end-cost full funding, but there is evidence to suggest that this point is still not as well understood as it might be, because of the conflicting definitions of incremental funding and full funding.

Revisions of the DAR and the Policy Memorandum on Multiyear Procurement [14] are needed to embody the results of the new legislation. These revisions should provide good opportunities to employ language that would help to avoid misunderstandings such as those just described.

III. CHANGES IN MULTIYEAR CONTRACTING AND ADVANCE PROCUREMENT

The proponents of expanded multiyear contracting have sought a number of advantages, including (1) lower procurement prices, (2) increased industrial productivity, and (3) a broadening of the defense industrial base. It is argued that these would flow from the improved production scheduling, productivity increasing front-end investments, and economies of scale that could be achieved if the restrictions on multiyear contracts were relaxed. Here the purpose is to outline the main changes proposed for multiyear contracting and advance procurement, together with the changes legislated in the DoD Authorization Act, 1982.

CHANGES IN MULTIYEAR CONTRACTING

Most proponents of expanded multiyear contracting believe the key change concerns the ceiling on cancellation charges for the SFMYC. It was proposed either to abolish the ceiling altogether, or to raise it from $5 million to somewhere in the range $25 to $100 million, or to define the ceiling as a percentage of total contract value, say 25 percent. The Senate bill called for a ceiling of $50 million; [11] the House preferred a ceiling of $100 million; [10] the latter figure has just been enacted into law. [5]

This $100-million ceiling may be exceeded only after 30 days written notification to the House and Senate Armed Services and Appropriations Committees. By means of notification the Congress retains the opportunity to "opt out" from such a multiyear procurement, or to require a specific cancellation ceiling in the particular case. Formerly, when a Service wished to breach the statutory ceiling, Congress had to be asked to "opt in" by giving its explicit approval. The new statutory ceiling is thus not so much a limit as it is a notification threshold. It should not be assumed, however, that this less demanding notification arrangement indicates any immediate relaxation of Congressional concern about the need for careful choice in

the use of multiyear contracting for major-system procurements.*

Within the higher cancellation ceiling, it was proposed to extend the contractor's protection so that in the event of cancellation he could claim both recurring and nonrecurring costs. There have been several versions of this proposal, most placing the contractor whose SFMYC is "canceled" on about the same footing (with respect to the types of costs allowable for reimbursement) as a contractor whose annual contract is "terminated." The DoD Authorization Act, 1982, makes this possible by giving the Secretary of Defense discretionary power to make regulations allowing both types of cost as reimbursable expenses in the event of contract cancellation.

This extension, together with the large increase in the statutory cancellation ceiling, raises questions about the Government's unfunded liability in the event a high-dollar SFMYC is canceled. The proponents of change argue that this liability can be controlled and that the acceptance of the risk of some modest unfunded liability is worth the benefits to be expected from the change.

The third major change proposed in multiyear contracting would remove the requirement for level pricing. Again there are several versions. One proposal calls for a pricing profile based on the actual allowable costs incurred by the contractor. This approach bears some resemblance to the way work is paid for under most Research, Development, Test, and Evaluation (RDT&E) contracts, but would differ from payments under incrementally funded contracts in that complete end items would be called for. It may be difficult, however, to reconcile actual-cost pricing with the goal of obtaining a stated number of complete end items

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*For FY 1982, the DoD Appropriation Act states that major-system multiyear procurements may be initiated with funds provided by the act only if specifically authorized by the act as multiyear procurements (Ref. 28, Section 769). This provision reflects the view of the House Appropriations Committee that, for FY 1982 at any rate, the Congress should be involved in the decision to initiate multiyear procurement of *any* major defense system, not just those procurements for which the contract cancellation ceiling exceeds the new statutory limit--a "major system" being defined as one so designated by the Defense System Acquisition Review Council (Ref. 29, pp. 185-192, esp. p. 191). Presumably the Congress will become less "involved" in the future if multiyear procurements are a demonstrated success.

at predetermined unit prices. Proposals based on a contractually agreed cost-quantity relationship may be a more fruitful approach to achieving fully funded multiyear procurements at prices fixed but not level.

The requirement for level pricing was not explicitly addressed in the House and Senate Defense Authorization bills, and it was not mentioned in the DoD Authorization Act, 1982. That Act, however, authorizes the Secretary of Defense to "prescribe defense acquisition regulations to promote the use of multiyear contracting . . . in a manner that will allow the most efficient use of multiyear contracting." [5] Presumably the Secretary will be able to relax the level-pricing requirement by making appropriate changes in the DAR.

CHANGES IN ADVANCE PROCUREMENT

As already explained, advance procurement has been limited in principle to purchases of small quantities of long lead time components for the purpose of shortening the time required to finish assembly of the complete end item. In other words, advance procurement originally aimed at schedule compression rather than cost savings. Now, however, advance procurement is perceived as a method for achieving both these objectives and others as well. It has been proposed to authorize advance procurement contracts:

1. To be used for multiyear advance procurements with sequential funding.
2. To include raw materials and parts as well as components.
3. To buy in economic order quantities (EOQs).
4. To encourage subcontractors to produce at more efficient production rates.
5. To encourage subcontractors to enter and continue in the defense market, thus
   - o strengthening the defense industrial base, and
   - o improving the opportunities for buying competitively.

Except for item 5, all these uses of advance procurement were explicitly authorized by the DoD Authorization Act, 1982, and item 5 is clearly in the spirit of the Act. Moreover, the Act contains no words to suggest that advance procurement should continue to be limited to only a "small" fraction of end-item cost. [5]

It appears, therefore, that advance procurement contracts can be used widely in the future, in both the annual and multiyear form. Advance procurement contracts in the multiyear form may also be used *either* to support multiyear, complete-end-item contracts *or* partly to substitute for them as a means of achieving production efficiencies and cost savings. In other words, the procurement of complete end items could continue to be handled in the normal way, by means of annually funded annual contracts, while multiyear advance procurement contracts could be used to exploit opportunities for production efficiency and cost savings in purchasing selected inputs to the production of the complete end item. Thus it may be possible to achieve substantial savings through a multiyear advance procurement while continuing to enjoy the advantages of annual contracting for the bulk of a procurement program.

There is, however, almost always some risk that the programmed number of complete end items will not be manufactured, and therefore that the inputs contracted for in advance procurement will turn out to be excess to manufacturing needs. The consequences are generally not serious when the advance procurement contract is limited to a single year's requirement of inputs that are end items themselves, or can be used as spare parts, or, like some raw materials, can find a ready civilian market. But the risk of overbuying presumably increases as the advance procurement contract is expanded to provide for additional future years of requirements.* And the consequences of overbuying presumably become more serious as the contract is extended to include "bits and pieces" for which, apart from their role as inputs to end-item production, there is neither military use nor civilian market. The achievement of net savings through expanded use of advance procurement will require a careful weighing of these risks and their consequences.

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*It is significant that Secretary DeLauer's October 1981 Memorandum on funding calls for the multiyear procurement of economic order quantities of components, parts, and materials *to be funded to the "termination liability."* (For definition, see Appendix A.) The additional up-front funding needed to cover termination liability will be provided by the Office of the Secretary of Defense, over and above the Service's budget. [15]

IV. ISSUES OF CHOICE IN APPLYING THE NEW LAW

NEW PROCUREMENT OBJECTIVES AND EXPANDED CONTRACTING OPTIONS

As a result of the new legislation, [5,28] the Services will now be able to pursue a richer set of procurement objectives and in doing so to use a greater variety of funding-contracting modes. Annual contracts will presumably be used somewhat less frequently, being partly replaced by contracts for multiyear procurement sometimes full front funded but usually funded sequentially. These latter will sometimes be used to buy major systems. Advance procurements will be multiyear as well as annual. Many different combinations of procurement and advance procurement contracts will be possible. These opportunities will probably lead to a period of experimentation by acquisition and financial managers. Today defense procurement obligations are characterized by a high percentage of full funding and a modest (though increasing) element of advance procurement (that is, procurement of items other than complete end items). In the future, unfunded liabilities and liabilities for non-end-items can be expected to increase, perhaps only modestly but perhaps dramatically. A careful risk assessment will be needed.

New and multiple objectives can be pursued. Previously, as just discussed, advance procurement was authorized only as a means of shortening the period required to obtain complete end items. With the new legislation, this method of contracting can be used for objectives as diverse as inflation avoidance in procuring raw materials, establishing efficient production rates, and strengthening the lower tiers of the industrial base. In the 1970s, the principal objective of the multiyear procedure, according to the 1976 edition of the DAR, was "to generate realistic competition by minimizing competitive disadvantage" among contractors. [30] Today, the DoD Authorization Act, 1982, emphasizes reduced costs to the Government through incentives for contractors to increase productivity by investing in new plant and using new technology.

Thus it appears that the result of the statutory changes will be to open up many new choices for acquisition and financial management and to present managers with some challenging questions to be resolved.

Five key sets of issues can be identified:

- How will the Defense Acquisition Regulation (DAR) be revised to implement the broad guidelines provided in the new legislation and thus promote the use of multiyear and advance procurement contracting? The specifics will be critical in determining the distribution of financial risk among the various actors in the procurement process, and hence in motivating industry to make the front end investments and other adjustments thought to be needed.
- Will the Secretary of Defense use his discretionary powers to abolish or modify the existing DAR requirement that sequentially funded multiyear contracts must call for fixed, level prices? If level pricing is no longer required, what kinds of pricing profiles can be substituted, and how will they relate to expected cost-quantity curves?
- To what extent can (and should) expanded advance procurement substitute for multiyear contracting for complete end items? How should multiyear advance procurements be funded?
- How will multiyear contracting affect price competition among both prime contractors and subcontractors in the production of the items contracted for? How can effective competition be best achieved in multiyear procurement?
- How will suitable procurements be selected for multiyear contracting? How will the prescribed criteria be applied, and how will the risks of making poor choices be assessed and weighed against expected benefits? To what extent should multiyear contracting be used to enhance program stability as well as to exploit inherent stability?

To discuss all of these in any detail would go far beyond the scope of this Note, but something can be said here about the last two sets of issues.

MULTIYEAR CONTRACTING AND COMPETITION

How is multiyear contracting likely to affect price competition among prospective producers of military equipment? Some years ago it seems to have been taken for granted that SFMYCs would foster competition--an assumption reflected in the DARs of the mid-1970s. More recently, doubts have been expressed about this favorable effect, especially by some representatives of industry. The Department of Defense Authorization Act, 1982, notices that multiyear contracting may affect competition but merely requires that the new policy should be administered so that it will not "preclude or curtail the existing ability of agencies in the Department of Defense to . . . provide for competition in production." [5] The Act did not identify the enhancement of competition as one of the criteria to be applied in choosing procurements suitable for multiyear contracting.

The reason for uncertainty about the effect of multiyear contracting on competition is that two opposing factors are at work: (1) the size of the contract and (2) the frequency of contract awards. Different conclusions can be reached depending on which of these factors is emphasized.

Multiyear contracts would normally be substantially larger than annual contracts and therefore presumably more attractive to prospective producers; the larger contracts might stimulate additional firms to bid as well as more aggressive bidding among the firms that do compete. Furthermore, even when one producer already has the advantage of accumulated experience in producing the item, a follow-on multiyear contract (unlike an annual contract) might call for production

quantities large enough that new producers could hope to overcome the first producer's advantage from being "farther out" on the cost-quantity curve.

With multiyear contracting, however, there are fewer contracts to be awarded, hence fewer opportunities for competition. The multiyear contract may thus "lock out" contractors who might have competed later on if procurement had been conducted by means of a series of annual contracts. This point is made by some industry representatives. To it there are several replies. From the buyer's viewpoint, the significant thing is not the number of opportunities for producers to compete for contract awards. Rather, it is the strength of the producers' incentives to compete, the number of qualified competitors, and the intensity of the competition when there is an award to be made--all of which may well be enhanced by the greater size of the multiyear buy. Moreover, although prospective suppliers may be "locked out" by multiyear contracts, the winner of the award is "locked in," often to the buyer's advantage. If the multiyear contract is awarded on a competitive basis, the whole of the multiyear buy is procured at competitive pricing, whereas under annual contracting the awards for the second and subsequent years are often *de facto* sole source, with the first-year producer then exploiting his sole-source position and selling at prices higher than he could otherwise demand.

More experience and study are needed before these counter-arguments can be weighed and the effect of multiyear contracting on competition adequately understood. In any case, however, there are likely to be few opportunities for competition among prime contractors for the production of major systems. For a major system there is normally only one developer and hence only one qualified producer. With or without multiyear contracting, price competitition among producers can be expected to be limited mainly to subcontractors and to the prime contractors of nonmajor systems.

SELECTION CRITERIA FOR MULTIYEAR PROCUREMENTS

The proper choice of procurements is obviously of critical importance to the success of expanded multiyear contracting, especially at the beginning when the new procedures are on trial and will have to justify themselves to their critics, particularly in the Congress.

In general terms there appears to be good agreement as to the basis of choice, as shown by the three sets of criteria reproduced in Appendix B. First, of course, there should be the potential for realizing some substantial benefit to the Government, usually expressed in terms of immediate cost savings (that is, a lower unit price for the particular item being produced). More generalized, long-term savings through improvements in the level of productivity in defense industry as a whole, or through a broader base for competition, are sometimes mentioned in discussions of the benefits of multiyear contracting, but they are seldom identified as specific criteria of choice. When the industrial base, competition, and productivity are mentioned, it is usually because they are seen as contributing to immediate cost savings.* In addition to such savings, more timely deliveries and improved potential for surge production are sometimes mentioned as substantial benefits to be sought; and a case has been made for improved quality, although that benefit may be harder to establish.

Most of the criteria that are suggested relate not to the potential for benefits but rather to the likelihood of avoiding problems, especially for sequentially funded multiyear contracts.

- The procurement requirement should be stable; that is, the total number of items needed and the desired delivery rates should be expected to change little if at all during the period of the contract.

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*Note that the strengthening of the industrial base and the enhancement of competition are not referred to in the lists of criteria reproduced in Appendix B. The House Appropriations Committee has directed that these considerations should be addressed when materials are submitted to the Congress in justifying the initiation of a multiyear procurement. (See Ref. 29, p. 191.)

- Funding for SFMYCs should be stable; that is, there should be reasonable confidence that successive annual budget requests, authorizations, and appropriations will provide the funding required by the contract throughout the contract period. This implies that the items contracted for should have continuing high priority relative to the other items with which they must compete for procurement funding.
- The design of the item to be procured should be stable; that is, the item should be fully developed and tested with any deficiencies corrected, and there should be low probability of expensive engineering changes, modifications, or retrofits during the contract period. This may require one or more years of production experience before multiyear contracting begins;* the F-16 fighter-bomber provides an illustration.
- The probable cost of the item should be known with reasonable confidence, preferably for both annual and multiyear contracts. Good estimates for both contract types are needed for calculating potential cost savings.
- There should be confidence in the management skills and production capabilities of the potential contractors, both primes and subs.

Taken literally, these are extremely demanding criteria.† Very few systems could be expected to meet them all (or even most of them)

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*Note that if several years of production experience are required to establish design maturity before a multiyear contract is awarded, the producer may already have made most of his investments in production equipment and labor training before the time of award. When this is so, the multiyear contract might be too late to provide the special incentives for productivity-increasing investment hoped for by the proponents of multiyear procurement. This is not to suggest, however, that multiyear contracting would not contribute in other ways to increased production efficiency and reduced procurement prices.

†They are probably even more demanding for full front funded than for sequentially funded multiyear contracts, because of the high level of confidence that would presumably be needed in persuading the Congress to appropriate large sums years in advance.

with high confidence, and any that did would almost certainly have smooth sailing through the procurement phase, whatever the funding-contracting mode adopted. If these criteria are conscientiously applied, it is likely that, in any given year, only a few major systems would be in procurement under multiyear contracts.*

These criteria emphasize the *inherent* stability of the procurement chosen for multiyear contracting--stability in many dimensions, including the stability of funding. The adoption of such criteria therefore implies that multiyear contracting should be viewed mainly as a technique for exploiting the stability of a procurement rather than as a device for enforcing stability by the "threat" of the high-dollar termination or cancellation charges that could arise if a multiyear procurement were to be discontinued.† Nonetheless, multiyear procurement would clearly provide incentives for program stability. One of the critical issues in multiyear contracting concerns the degree to which these incentives should be relied on if the inherent stability of the program is questionable.

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*See the testimony of Thomas D. Morris and Secretary DeLauer, Ref. 16, pp. 760, 784, 806.

†For sequentially funded contracts, this threat would be strengthened by the prospect of *unfunded* liability unless the cancellation liability was funded up front.

Appendix A

DEFINITIONS FROM THE DOD POLICY MEMORANDUM ON MULTIYEAR PROCUREMENT, 1 MAY 1981

The following definitions are quoted without change from the DoD Policy Memorandum on Multiyear Procurement of 1 May 1981. That memorandum was written at a time of transition, in expectation of new legislation concerning multiyear procurement but before the enactment of the Department of Defense Authorization Act, 1982. In some respects, therefore, these definitions appear to anticipate future legislation or still-to-be-adopted amendments to the Defense Acquisition Regulation, whereas in some other respects they now appear to have been overtaken by events. We added the footnotes to put the definitions in perspective as of December 1981.

"Advance Procurement*

An exception to the full funding policy which allows procurement of long leadtime items (advanced long lead procurement) or economic order quantities of items (advance EOQ procurement) in a fiscal year in advance of that in which the related end item is to be acquired. Advance procurements may include materials, parts and components as well as costs associated with the further processing of those materials, parts and components.

"Annual Funding

The current Congressional practice of limiting authorizations and appropriations to one fiscal year at a time. The term should not be confused with two-year or three-year funds which permit the Executive Branch more than one year to obligate the funds.

"Block Buy

Buying more than one year's requirement under a single year's contract. A total quantity is contracted for in the first contract year. Block buys may be funded to the termination liability or fully funded.

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*The DoD Authorization Act, 1982, now specifically authorizes the use of advance procurement for economic order quantities and for raw materials and parts as well as components. In May 1981, however, neither the DAR nor DoD Directive 7200.4 (Ref. 2) had been amended so as to permit these additional uses of advance procurement. Such amendments can be expected in the near future.

"Cancellation

A term unique to multiyear contracts. The unilateral right of the Government not to continue contract performance for subsequent fiscal years' requirements. Cancellation is effective only upon the failure of the Government to fund successive FY requirements under the contract. It is not the same as termination.

"Cancellation Ceiling*

Upon cancellation, the maximum amount that the Government will pay the contractor which the contractor would have recovered as a part of the unit price, had the contract been completed. The amount which is actually paid to the contractor upon settlement for unrecovered costs (which can only be equal to or less than the ceiling) is referred to as the cancellation charge. Currently, this ceiling includes only nonrecurring costs.

"Full Funding

Funds are available at the time of award to cover the total estimated cost to deliver a given quantity of complete, militarily useable end items or services. Under current policy (DoD Directive 7200.4), the entire funding needs of the fiscal year production quantity must be provided unless an exception for advance procurement has been approved. A test of full funding is to ask the question, Does any part of this year's buy depend on a future year appropriation to result in the delivery of complete units? If the answer is yes, the contract is probably not fully funded. The principle of full funding applies only to the Procurement Title of the annual appropriation act and therefore affects production contracts but not RDT&E contracts.

"Incremental Funding

Funds are not available at the time of contract award to complete a fiscal year's quantity of end items in a finished, militarily useable form. Future year appropriations are required in order to complete the items or tasks. Incremental funding is commonly used for RDT&E programs.

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*The limitation to nonrecurring costs has been changed by the DoD Authorization Act, 1982, which permits the inclusion of recurring costs within the cancellation ceiling. Presumably the DAR will soon be amended to reflect this change.

"Multiyear Contract*

A contract covering more than one year's but not in excess of five years' requirements. Total contract quantities and annual quantities are planned for a particular level and type of funding as displayed in the current Five Year Defense Plan (FYDP). Each program year is annually budgeted and funded and, at the time of award, funds need only to have been appropriated for the first year. The contractor is protected against loss resulting from cancellation by contract provisions which allow reimbursement of costs included in the cancellation ceiling.

"Multiyear Funding

A Congressional authorization and appropriation covering more than one fiscal year. The term should not be confused with two-year or three-year funds which cover only a one-fiscal-year requirement but permit the Executive Branch more than one year to obligate the funds.

"Multiyear Procurement

A generic term describing situations in which the Government contracts, to some degree, for more than the current year requirement. Examples include multiyear contracts, block buys, advance EOQ procurement. Generally, advance long lead procurement in support of a single year's requirement would not be considered a multiyear procurement.

"Nonrecurring Costs

Those production costs which are generally incurred on a one-time basis include such costs as plant or equipment relocation; plant rearrangement; special tooling and special test equipment; preproduction engineering; initial spoilage and rework; and specialized work force training.

"Recurring Costs

Production costs that vary with the quantity being produced such as labor and materials.

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*In 1980 and for some years previously, a multiyear contract was defined by the DAR as a contract for procuring "planned requirements for up to a five-year period *without having total funds available at the time of award*" (Ref. 1, emphasis added). The DoD Authorization Act, 1982, apparently extends the definition of multiyear contract to include contracts that are full front funded. This change in definition will no doubt soon be reflected in the DAR.

"Termination for Convenience

Procedure which can apply to any Government contract, including multiyear contracts. As contrasted with cancellation, termination can be effected at any time during the life of the contract (cancellation is commonly effected between fiscal years) and can be for the total quantity or a partial quantity (whereas cancellation must be for all subsequent fiscal years' quantities).

"Termination Liability

The maximum cost the Government would incur if a contract is terminated. In the case of a multiyear contract terminated before completion of the current fiscal year's deliveries, termination liability would include an amount for both current year termination charges and outyear cancellation charges.

"Termination Liability Funding

Obligating sufficient contract funds to cover the contractor's expenditures plus termination liability but not the total cost of the completed end items."

Appendix B

CRITERIA FOR THE USE OF MULTIYEAR CONTRACTS

CRITERIA STATED IN THE DOD POLICY MEMORANDUM ON MULTIYEAR PROCUREMENT, 1 MAY 1981

"1. Benefit to the Government. A multiyear procurement should yield substantial cost avoidance or other benefits when compared to conventional annual contracting methods. MYP structures with greater risk to the Government should demonstrate increased cost avoidance or other benefits over those with lower risk. Savings can be defined as significant either in terms of dollars or percentage of total cost.

"2. Stability of Requirement. The minimum need (e.g., inventory or acquisition objective) for the production item or service is expected to remain unchanged or vary only slightly during the contemplated contract period in terms of production rate, fiscal year phasing, and total quantities.

"3. Stability of Funding. There should be a reasonable expectation that the program is likely to be funded at the required level throughout the contract period.

"4. Stable Configuration. The item should be technically mature, have completed RDT&E (including development testing or equivalent) with relatively few changes in item design anticipated and underlying technology should be stable. This does not mean that changes will not occur but that the estimated cost of such changes is not anticipated to drive total costs beyond the proposed funding profile.

"5. Degree of Cost Confidence. There should be a reasonable assurance that cost estimates for both contract costs and anticipated cost avoidance are realistic. Estimates should be based on prior cost history for the same or similar items or proven cost estimating techniques.

"6. Degree of Confidence in Contractor Capability. There should be confidence that the potential contractor(s) can perform adequately, both in terms of Government furnished items (material, data, etc.) and their firm's capabilities. Potential contractors need not necessarily have previously produced the item."

CRITERIA STATED IN THE HOUSE OF REPRESENTATIVES DEFENSE AUTHORIZATION BILL H.R. 3519, 12 MAY 1981

The head of an agency may make multiyear contracts for periods of not more than five fiscal years of procurement whenever he finds:

"(A) that the use of such a contract will promote the national security of the United States and will result in reduced total costs under the contract;

"(B) that there will be a continuing requirement for the items to be purchased in quantities consonant with current plans for the proposed contract period;

"(C) that there is a low risk of contract cancellation; and

"(D) that there is a stable design for the items to be acquired for which the technical risks are not excessive."

CRITERIA STATED IN THE DEPARTMENT OF DEFENSE AUTHORIZATION ACT, 1982

The head of an agency may make multiyear contracts whenever he finds:

"(A) that the use of such a contract will promote the national security of the United States and will result in reduced total costs under the contract;

"(B) that the minimum need for the property to be purchased is expected to remain substantially unchanged during the contemplated contract period in terms of production rate, procurement rate, and total quantities;

"(C) that there is a reasonable expectation that throughout the contemplated contract period the Department of Defense will request funding for the contract at the level required to avoid contract cancellation;

"(D) that there is a stable design for the property to be acquired and that the technical risks associated with such property are not excessive; and

"(E) that the estimates of both the cost of the contract and the anticipated cost avoidance through the use of a multiyear contract are realistic."

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