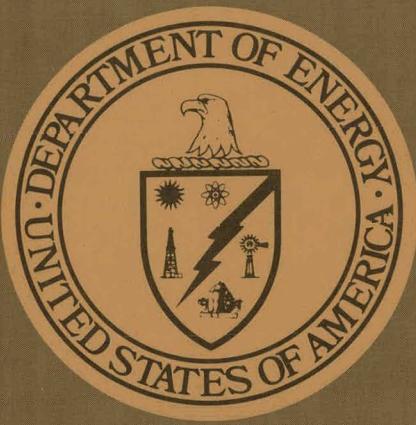


DOE/CR-0015

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COST & SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT

IMPLEMENTATION GUIDE

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**OFFICE OF THE CONTROLLER
DEPARTMENT OF ENERGY**

MAY 1980

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MAY 1980

FOREWORD

This document provides uniform guidance for implementation of the DOE Order 2250.1, Cost and Schedule Control Systems Criteria (CSCSC) for Contract Performance Measurement. It will assist both DOE and contractor representatives in fulfilling their responsibilities for meeting CSCSC requirements. Implementation of the Criteria consistent with the guidance contained herein will avoid imposition of separate duplicate management control systems on contractors. Compliance with the contractual requirements for work definition, cost and schedule control, and performance reporting will provide increased assurance that a contractor's progress is sufficiently visible to reliably indicate status and to provide the basis for timely and meaningful management decisions.

This is the second in a series of CSCSC guidance documents, the first having been the DOE/CR-0014 "Summary Description", August 1979. Detailed guidance on the use of the work breakdown structure technique, systems review and surveillance, and contractor reporting and data analysis will be provided in subsequent separate DOE guides.



for
Jack E. Hobbs
Controller

DOE COST AND SCHEDULE CONTROL SYSTEMS CRITERIA
FOR CONTRACT PERFORMANCE MEASUREMENT
IMPLEMENTATION GUIDE

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CHAPTER I - INTRODUCTION

A. PURPOSE

This guide describes the DOE Cost and Schedule Control System Criteria (CSCSC) for Contract Performance Measurement and provides DOE and its contractors uniform guidance for CSCSC implementation in compliance with DOE Order 2250.1. Implementation refers to the application of the CSCSC to specific contracts, the assessment of contractors' management systems for compliance with the requirement, and subsequent DOE systems validation or acceptance verifying the contractor's compliance. Any supplemental instructions by individual DOE organizations will be consistent with the DOE Order and with this and other CSCSC guidance documents.

For purposes of this guide, the term "Criteria" is synonymous with CSCSC. This guide also makes use of certain functional descriptors, e.g. Cognizant Auditor, rather than specific organization titles. This permits maximum flexibility in application of guidance and avoids the need to deal with redesignation of organizational titles. Terms related to the Criteria are defined in the Glossary, Attachment 1.

B. MANAGEMENT NEEDS

DOE has a fundamental responsibility to ensure the visibility of a contractor's progress in accomplishing the contract's scope of work. In carrying out this responsibility DOE receives and reviews contract cost and schedule performance data. The data reported should facilitate the management of the contract effort and assist DOE Project Managers with their reporting require-

ments. To be meaningful, the data submitted by contractors must:

- o Portray time-phased budgets and estimates for specific scheduled contract tasks;
- o Indicate work progress;
- o Relate cost, schedule, and technical accomplishment and problems;
- o Be valid, timely and auditable; and
- o Supply DOE Project Managers with information at a practical level of summarization.

Contract performance measurement data should be derived from the same internal management control systems used by the contractor to manage the contract effort and determined by DOE to satisfy the Criteria. Such systems will provide a common source of information required by both contractor and DOE management. DOE's contract reporting requirements are specified separately from the Criteria in each solicitation and in the contract. The Cost Performance Report, designed specifically to depict the output of the contractor's management control systems, and a group of related reports satisfy these reporting requirements. The report forms and instructions for their selection and placement on contract by DOE and their accomplishment by the contractor are contained in DOE/CR0001/2, DOE Uniform Contractor Reporting System (UCRS) Guidelines, Volume 1; additional details on the reports and their analysis are in DOE/CR-0017, CSCSC Contractor Reporting/Data Analysis Guide.

C. CRITERIA CONCEPT

The complexity and importance of DOE's acquisition activities dictate the use of management techniques that aid effective project planning and control. It is recognized that no single common set of contractor management control systems will meet the needs of both DOE and a variety of contractors.

Due to variations in contractor organizations, products, and working relationships, it is not practicable or desirable for DOE to prescribe a universal system for cost and schedule control. Thus, DOE has adopted an approach which simply defines the Criteria that contractors' management control systems must meet to be validated or accepted by DOE.

The Criteria are sufficiently general in nature to permit their use on contracts supporting research, development, demonstration, construction, production, or operations and maintenance projects. Since these contracts will differ significantly because of the work involved, value, type of contract, etc., it is impossible to provide detailed guidance which will apply specifically in all cases. The reader should be alert for areas in which distinctions in detailed interpretations seem appropriate or reasonable, whether or not they are specifically identified herein.

D. MANAGEMENT CONTROL SYSTEMS REQUIREMENTS

When required by the contract, the management control systems used by the contractor in planning and controlling the effort must meet the Criteria set forth in Attachment 1 to DOE Order 2250.1 and reiterated as part of the Criteria Checklist, provided in Attachment 2 to this Guide. These Criteria require the performance of certain basic planning and control functions and the existence of characteristics and capabilities normally inherent in sound management control systems. Under this approach, contractors' management control systems are required, in general, to provide for:

- o Dividing the effort into discrete pieces of assigned work within an agreed-upon Work Breakdown Structure;
- o Assigning specific responsibility for the work within the organization structure;
- o Scheduling the work using meaningful milestones to facilitate planning and the measurement of accomplishment;

- o Providing realistic budgets for increments of scheduled work to establish the baseline for contract performance measurement;
- o Measuring consistently the planned value of work accomplished (earned value);
- o Controlling and accurately accumulating the costs related to planned progress of the work;
- o Providing comparisons between the earned value and the cost of the actual resources applied, and the planned value of work scheduled;
- o Developing reliable estimates of costs to complete the remaining in-scope work;
- o Supporting an overall capability for analysis of available information so as to identify problem areas in time to take remedial actions; and
- o Providing effective change control procedures to ensure baseline integrity.

Contractors have maximum flexibility in determining how internal operations are to be conducted, thereby avoiding the operation of separate, duplicate cost and schedule control systems. Changes to existing systems should be held to a minimum. This approach allows contractors to use existing management control systems, or other systems of their choice, provided they meet the Criteria. The end result is the use of contractor's management control systems to satisfy both the contractor's and DOE's needs.

E. BENEFITS OF CRITERIA APPLICATION

Use of the Criteria approach must be based on common sense. This means their application should be related to the benefits to be derived. Potential benefits accrue to both DOE and contractor management. DOE personnel gain a good working knowledge of the contractors' organization, systems operation and procedures, and the mechanics of report preparation. The standardization and discipline

inherent in the Criteria approach provide more detailed and timely planning of the contract work. Also, DOE is assured that contract performance is being measured against a formal, contract-related baseline rather than against a contractor's internal operating plan which may vary from the contractual commitment. Finally, implementation of the Criteria approach enhances overall project management by promoting the integration and effectiveness of the following interrelated activities:

- o Financial control (cost management, contract administration, contract change control, funds management);
- o Schedule control (schedule management, controlled milestones, schedule change control); and
- o Technical control (design management, configuration management, systems engineering).

Contractors, in turn, gain improved discipline in systems operation, better communication internally and with DOE, more detailed and earlier visibility of work progress, and increased cost and schedule awareness at all functional levels, particularly at lower levels of management.

F. JOINT PARTICIPATION

Successful contract performance measurement through use of management control systems which meet the Criteria, is the result of a combined and coordinated effort between DOE and the involved contractors. Furthermore, it requires the participation and coordinated efforts of various DOE organizational elements as described in Chapter III. The DOE/contractor participation in CSCSC implementation activities is depicted in Figure 1. The responsibility for developing and using management control systems in compliance with these Criteria is vested in the contractor, but the specific systems proposed are subject

ACTIVITY	RESPONSIBLE PARTICIPANT	
	DOE	CONTRACTOR
Designate Projects to Apply Criteria Approach on Contract	X	
Develop Project Summary Work Breakdown Structure	X	
Formulate Acquisition Strategy for Project	X	
Select Appropriate Contracts for Full or Modified Criteria Implementation	X	
Prepare Criteria Implementation Plan (Clauses, Reports, Reviews)	X	
Specify Criteria Requirements in Solicitation	X	
Submit System Description and Contract Work Breakdown Structure in Proposal		X
Evaluate Proposals	X	
Award Contracts with Criteria Requirements and Select Subcontracts for Criteria Implementation	X	
Coordinate Implementation Activity	X	X
Review Contractor's Management Control Systems for Compliance with Contractual Requirements	X	
Correct Discrepancies Identified During Review		X
Document Systems Validation or Acceptance	X	
Perform Systems Surveillance	X	X
Operate Systems and Submit Cost/Schedule Performance Reports		X
Analyze Performance Reports and Use Results (Status Assessment, Trend Identification, and Forecasts) for Management Purposes	X	X

FIGURE 1 CRITERIA IMPLEMENTATION ACTIVITIES

to DOE assessment and subsequent validation or acceptance. In instances where DOE determines that the contractor's systems do not meet the Criteria, necessary adjustments to achieve compliance will be required. Differences in interpretation of Criteria application between DOE representatives and the contractor which cannot be resolved locally should be directed to the DOE Controller for resolution.

After validation or acceptance of the contractor's systems, DOE relies on these systems to provide the necessary management controls. Contractors having systems previously validated or accepted are encouraged to maintain their essential elements and disciplines for ready implementation on future DOE contracts.

G. SCOPE

The Criteria, in accordance with DOE Order 2250.1, may be applied on selected contracts within designated projects in either a full or a modified version. The primary difference between the two versions is the degree of latitude DOE exercises in specifying the Criteria requirements and the subsequent determination of contractor compliance with the requirement. The modified implementation introduces additional flexibility into the implementation process to accommodate such contract factors as lesser dollar value, risk, criticality, or prominence.

The contracts selected for full Criteria implementation will meet one of the following guidelines:

- o The contract has a total estimated dollar value in excess of \$50 million;
- o The contract work is of high national or DOE urgency or attracts unusually high national or DOE interest;
- o The contract work has special problem areas or known high risks that are expected to exist during the contract' period; and

- o The contract has been recommended for full Criteria implementation by a Program Office Director.

The contracts initially selected for modified Criteria implementation will meet one of the guidelines listed below. Final designation will be made by the cognizant Secretarial official.

- o The contract has a total estimated dollar value between \$2 million and \$50 million.
- o The contract period of performance is more than one year.
- o The contract has been recommended for modified Criteria implementation by a Program Office Director.

Implementation of the Criteria on an existing contract is subject to contractual agreement between the contractor and DOE. Subcontracts may be selected for application of the Criteria by mutual agreement between the prime contractor and DOE Project Manager, according to the criticality of the subcontract to the project. Firm-fixed-price or firm-fixed-price with economic price adjustment contracts or subcontracts ordinarily will not be selected for application of the Criteria. All other types of new contracts, including fixed price incentive contracts, may have the Criteria applied. Implementation of the Criteria is not intended to affect the basis on which progress payments or cost reimbursements are made. The Criteria do not address the basis for payment or cost reimbursement.

CHAPTER II - CRITERIA DISCUSSION

A. INTRODUCTION

The Criteria explanations and interpretations contained in this chapter are intended to ensure the appropriate implementation of DOE's contract performance measurement requirements. As discussed in paragraph I. G., the Criteria may be applied in a full or modified version depending on DOE's requirements. Generally, the two implementation versions may differ with regard to the detail required in contract work definition, the level and composition of the control point selected for management of the work, and the extent of the contractor's systems documentation.

B. ORGANIZATION

The Organization section of the Criteria is concerned principally with definition of work required to be performed by the contractor and with the assignment of tasks to organizations responsible for performing the work. It requires that all authorized work be defined within the framework of a Contract Work Breakdown Structure. DOE/CR-0016, Work Breakdown Structure (WBS) Guide, provides guidance for preparing and using work breakdown structures.

1. Contract Work Breakdown Structure (CWBS). The contractor's extension of the Project Summary WBS (PSWBS) should reflect the contract scope of work and the way the contract work is to be managed and performed. It must include the CWBS elements specified by DOE for reporting, the products or services (including contract line items and major subcontracts, as applicable) to be provided, intermediate levels, and cost accounts. The lower level elements should be meaningful products or task oriented subdivisions of a higher level element.

a. The CWBS serves many purposes and facilitates contract planning by providing a formal structure for identifying and relating the work and the work products. It simplifies the problems of summarizing contract or project oriented data, and it establishes the reporting

structure for DOE required management information. CWBS planning should take into consideration performance measurement data element requirements, data summation characteristics, scheduling systems, technical performance parameters, configuration items, and actual cost history. The CWBS should recognize and accommodate the differences in the way work is organized and performed in the various phases of development and demonstration, including design, fabrication, installation, and construction.

b. There is a need for contractor flexibility in their extension of the PSWBS. Contractors may recommend and negotiate modifications to the preliminary CWBS. The contractors have complete flexibility in extending the negotiated CWBS to reflect their approach to accomplishing the work. It is not necessary to extend all branches of the CWBS to the same level. The basic objective is to subdivide the total contractual effort into manageable units of work. Large, complex, or high risk tasks may require numerous subdivisions; tasks of lesser size, complexity, or risk may require substantially fewer levels. There is no need to use "dummy" levels in order to force all segments of the CWBS to a common level. However, if this enables the contractor to use a particular data accumulation coding system more effectively, dummy levels are acceptable.

c. In the establishment of the CWBS lower levels, the differences between the type of effort performed by the various contractors involved must be recognized. For example, during system design, an architect-engineer's work normally is organized and performed along the lines of the major subsystems of the overall system. The design

begins with the overall concept and is developed, top down, in progressively greater detail until it is established at the component level. During construction, the opposite occurs. A bottoms up process is used. Components are joined together in progressively larger assemblies until the system and eventually the facility is completed. Additionally, construction is performed by work level and area, and it may be impractical for a contractor to use the same CWBS elements or levels that were used in the design. To facilitate proper contract management, extension of the CWBS should be compatible with the manner in which the work proceeds.

2. Interrelation of WBS and the Functional Organization. The CWBS helps define and organize the work to be performed by logical work subdivision. The contractor's organizational structure should reflect the way the people who will accomplish the work have been organized. To assign specific work responsibility, the CWBS and organizational structure should be interrelated with each other; that is, functional responsibility is established for performing identified units of work. This interrelationship may occur at any level, but the Criteria require that the integration exist both at the total contract level and at the level where performance of work is managed. Other natural points of integration may occur as a result of the manner in which the contractor's scheduling, budgeting, work authorization, estimating and performance measurement systems interface with each other and with the CWBS. Figure 2 depicts integration between the CWBS, the organization, and the different systems using typical contractor systems documentation. This Figure also refers to subsequent related Figures that provide further insight on systems integration.

CWBS LEVEL (See Fig. 3)	ORGANIZATION LEVEL (See Fig. 3)	SYSTEMS DOCUMENTATION				
		SCHEDULING (See Fig. 6)	BUDGETING (See Fig. 4)	WORK AUTHORIZATION (See Fig. 5)	ESTIMATING (See Fig. 5)	PERFORMANCE MEASUREMENT (See Fig. 7)
LEVEL 1 DEMONSTRATION PLANT CONTRACT*	REACTOR MANUFACTURING COMPANY	CONTRACT MASTER SCHEDULE	BUDGET CONTROL LOG	SALES ORDER	PROJECT OFFICE MEMO	DOE COST PERFORMANCE REPORT (CPR)
LEVEL 2 NSSS	ENGINEERING DEPARTMENT	INTERMEDIATE SCHEDULE (FUNCTIONAL)	BUDGET CONTROL LOG	TASK AUTHORIZATION	PROJECT OFFICE MEMO	NSSS CPR (SUMMARIZED DATA)
LEVEL 3 REACTOR SYSTEMS	DESIGN GROUP	INTERMEDIATE SCHEDULE (WBS)	BUDGET CONTROL LOG	TASK AUTHORIZATION	PROJECT OFFICE MEMO	REACTOR SYSTEM CPR (SUMMARIZED DATA)
LEVEL 4 RADIAL BLANKET COST ACCOUNT*	DRAFTING & CHECKING SECTION	COST ACCOUNT AUTHORIZATION	COST ACCOUNT AUTHORIZATION	TASK AUTHORIZATION	PROJECT OFFICE MEMO OR VARIANCE ANALYSIS REPORT	COST ACCOUNT CPR
WORK PACKAGE LEVEL FUEL SUBASSEMBLY	MECHANICAL DRAFTING UNIT	COST ACCOUNT PLAN	COST ACCOUNT PLAN	COST ACCOUNT PLAN	VARIANCE ANALYSIS REPORT	COST ACCOUNT CPR (WORK PACKAGE DATA)

* Integration of CWBS/Organization/Systems Required at the Contract and Cost Account Levels

FIGURE 2 CONTRACTOR CWBS/ORGANIZATION/SYSTEMS INTEGRATION

3. Establishment of Cost Accounts. The assignment of lower level CWBS elements to responsible lower level functional managers provides a key point for management control purposes and cost collection. The lowest CWBS level at which organizational responsibility for individual CWBS elements exists is referred to as the cost account level. At this level, actual costs are accumulated and compared with budgeted costs, i.e., performance measurement is conducted. Some contractors may choose to collect costs and make performance comparisons at a still lower level.

As the natural point for cost and schedule planning and control, the cost account provides a logical point for cost collection and evaluation. While it is usually located immediately above the detailed job level, a cost account may be located at higher levels when in consonance with the contractor's method of management. The data elements (Budgeted Cost for Work Scheduled (BCWS), Budgeted Cost for Work Performed (BCWP), Actual Cost of Work Performed (ACWP), Budget at Completion (BAC), Estimate at Completion (EAC), and variances) determined at the cost account level should be summarized up through both the CWBS and the organizational structure for reporting to higher levels of contractor management and to DOE.

a. As a key point for planning and controlling of the contractual effort, virtually all aspects of the management control systems come together at the cost account, including budgets (both for internal effort and for planned procurements), estimates, schedules, work assignments, cost collection, progress assessment, problem identification, variance analysis, and corrective action. Most management actions taken at higher levels are on an exception basis, based on significant problems identified at the cost account level. For these reasons,

the levels selected for establishment of cost accounts by the contractor should be carefully considered at the outset of a new contract to insure that the work will be properly defined into manageable units and that functional responsibilities and authorities are clearly and reasonably established. The quality and amount of visibility available during the performance of the contract will be directly relatable to the level and make-up of the cost accounts.

- b. Integration of the CWBS and organizational structure at the cost account level may be visualized as a matrix with the functional organizations listed on one axis and the applicable CWBS elements listed on the other axis. Figure 3 illustrates this relationship and includes a sample coding structure. Each organization may then be clearly identified with the work for which it is responsible. Further subdivision of the work may be accomplished by the responsible organization manager by assigning work to supporting units for performance. Critical subcontracts (as determined by the prime contractor and DOE Project Manager) must also be separately measured and integrated into the CWBS. Subcontracts may be identified and treated as individual CWBS elements and cost accounts, if their value, complexity, and need for visibility warrants.
- c. Contractors should be given flexibility in the points of interface between the CWBS and their organizational levels. Cost accounts should not be established below the level at which cost and schedule management capability and responsibility actually exist. The organizational level selected for cost account responsibility should be

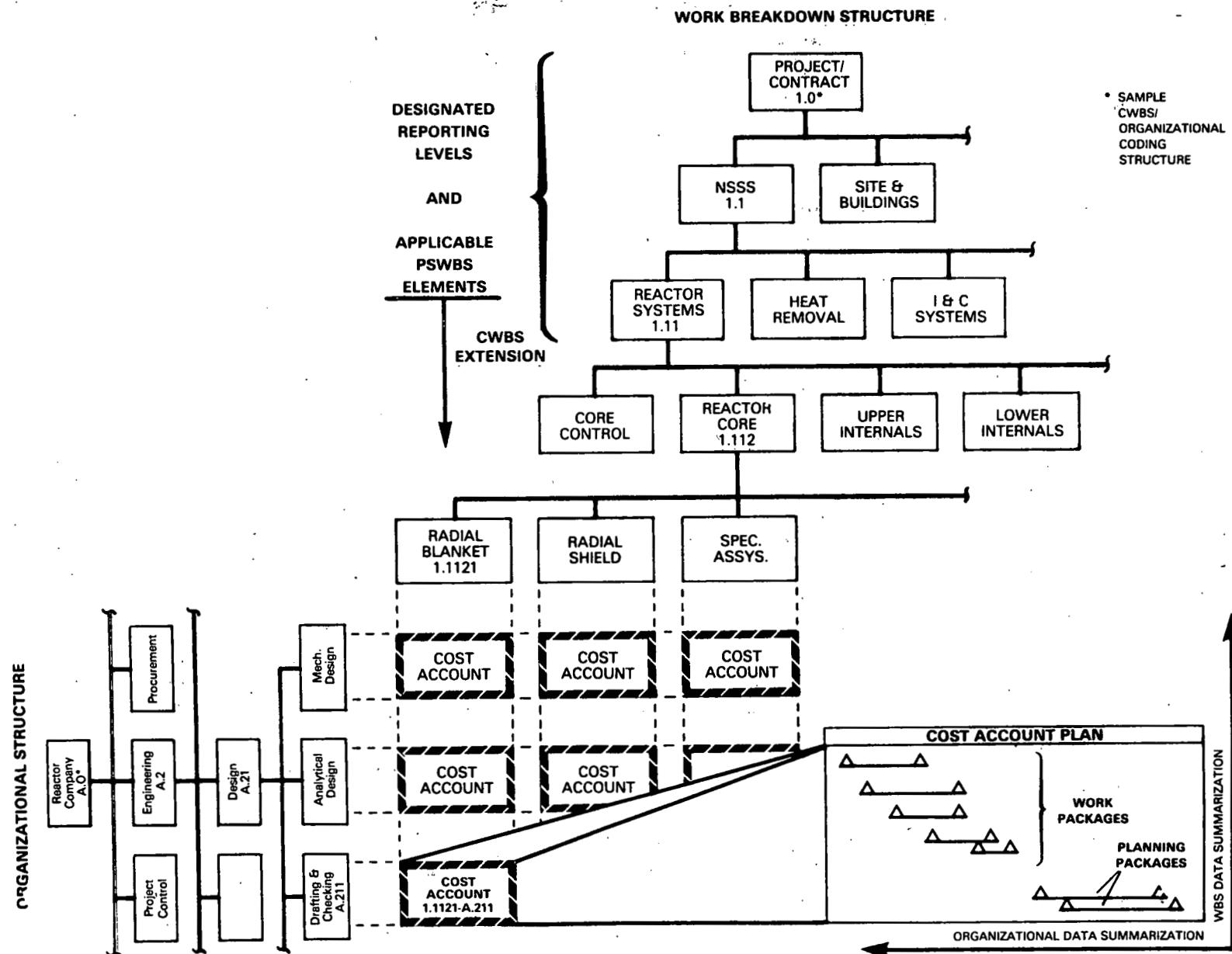


FIGURE 3 INTEGRATION OF WORK BREAKDOWN STRUCTURE AND ORGANIZATIONAL STRUCTURE

consistent with the level of management responsible for cost and schedule performance. This avoids the generation of plans, documents, and performance reports which do not improve management control. Similar factors should be considered in selecting the CWBS level at which cost accounts are established.

- d. While all direct costs are accumulated in cost accounts, the Criteria do not require the recording of indirect costs at this level. Contractors must, however, be able to identify the managers responsible for controlling the indirect costs that are allocated to government contracts. Indirect budgets should be established and assigned to the organizational managers responsible for controlling such costs. Further, overhead pools and corresponding budgets must be designated and the methods used for allocation clearly defined and documented.
- e. At the cost account level all work should be planned in one of three different types of effort:
 - o Work Packages - discrete tasks which have a specific end product or end result;
 - o Level of Effort (LOE) - work which does not result in a final product, e.g., liaison, coordination, follow-up, or other support activities; and
 - o Apportioned Effort - factored effort which can be directly related to other discrete tasks, e.g., portions of quality control or inspection.

All work under the contract must eventually be planned as, and placed in, one of these categories during the performance of the contract.

4. Work Packages. In a full Criteria implementation, work packages constitute the basic building blocks used by the contractor in planning, controlling, and measuring contract performance. To be effective, a work package should have the characteristics delineated in the Glossary, Attachment 1. In full Criteria implementation, a work package is simply a lower level task or job assignment within a cost account. It describes the work to be accomplished by a specific performing organizational element and serves as a vehicle for monitoring and reporting progress of work. In the case of a modified Criteria implementation, objective indicators reflecting groups of tasks may be used and viewed as work packages. Thus, the term "work package" can refer to a single task within a cost account or a grouping of such tasks at the cost account level. It is a generic term used to identify discrete tasks or grouping of tasks which have a definable end result.

- a. Work packages should be natural subdivisions of effort planned according to the way the work will be done and such planning should satisfy the requirements for performance measurement. From the standpoint of evaluating accomplishment, this means that the work-in-process assessment should be minimized. On short work packages, little or no assessment of work-in-process is required because their earned value measurement is based mainly on completed work packages. On longer work packages, valid work-in-process assessment should be achieved by use of objective indicators, such as discrete milestones with pre-assigned budget values or completion percentages to subdivide the work.
- b. Work packages vary significantly between contractors and between their organizational functions. Within a contractor's organization, work

packages will differ depending on several factors, including the type and amount of work involved, its complexity, the schedule constraints, etc. For example, component fabrication work packages tend to be relatively simple and short. In contrast, an engineering design work package may entail preparation of a complex specification and require a number of months to complete. For these reasons, the Criteria do not impose specific limitations on work package duration. It should be recognized, however, that performance measurement is accomplished and reported to DOE on a monthly basis for summary level items. As mentioned above, the earned value reported should be based on completed work plus a determination of the amount of work-in-process completed. Unless objective indicators are used to promote the work-in-process evaluation, work packages which extend over several reporting periods may require an undesirable amount of subjective evaluation to determine the amount and value of in-process work completed as of the reporting cutoff date. On the other hand, work packages which start during one reporting period and end during that period or the next, provide a more objective basis for determining status of contract work. This does not mean that the Criteria require work packages to be limited to two months in duration, but rather that logical and rational methods for evaluating completed work-in-process should exist.

5. Level of Effort (LOE). Support type effort, or LOE activity, is measured differently from discrete tasks. While discrete task accomplishment can be measured through various methods based on the completed work, LOE is "measured" through the passage of time (i.e., the BCWP is equal to the BCWS

for the reporting period). LOE must be segregated from discrete work in order to avoid distorting its measurement. Normally, LOE costs are accumulated separately from work package costs in order to permit the evaluation of the measurable effort prior to its combination with the LOE data. For example, this separation could be accommodated by adding a suffix to the code for the cost account number in Figure 3. The amount of LOE activity will vary among performing organizations, but within each organization LOE should be held to the lowest practical level. The Criteria do not establish guidelines as to how much LOE is acceptable, but require that only work which cannot be measured or apportioned be designated LOE. LOE, like work packages, should be budgeted on a time-phased basis for control and reporting purposes.

6. Apportioned Effort. Apportioned effort is dependent upon or related in direct proportion to the performance of other work. For example, quality assurance and other inspection functions may be planned as apportioned effort based on the amount of design drawings or construction effort. Apportioned effort may be included and budgeted as a part of the discrete task to which it relates or may be established as a separate task with its own budget based on a percentage of the related task budget. Costs must be accumulated consistent with the manner in which the apportioned effort is budgeted. Factors established for budgeting apportioned effort and measuring its earned value must be documented and applied in a formal, consistent manner. Apportioned effort should be limited to that which is genuinely related to discrete effort.

7. Detailed Planning. While all contractual effort is eventually planned and controlled in detail, such planning may not be practical or possible for an entire contract at the outset. A "rolling wave" or incremental planning approach may be used in doing the detailed planning. Under this approach,

work is planned in finite, but sizable planning increments at the outset of a contract. These planning increments form the basis for initial work authorization, budgeting and scheduling. As the near term contract work is defined and planned in more detail, tasks suitable for job assignment evolve naturally and the work is segregated into cost accounts, work packages, LOE, etc. Thus, the contractual effort is progressively divided into smaller segments as work on the contract proceeds and as responsibility is assigned to successive lower levels of management. However, such work definition must be accomplished in sufficient time for budgets to be developed and detailed plans for work accomplishment to be completed. Detailed planning extending approximately six months into the future should provide adequate planning and control. However, the extent of the detailed planning is determined by the nature of the work. For example, the design of a particular system could be unusually difficult to develop and until the final configuration is determined, detailed planning could encompass less than six months. Once work has been defined and budgeted, controls should be established to minimize further changes to the budget, schedule, or scope of that work, particularly in the near time frame (approximately 30 days).

C. PLANNING AND BUDGETING

Generally, the planning and budgeting Criteria require that all authorized work be scheduled and that budgets be assigned to identified manageable units of work.

1. Planning. The assignment of budgets to scheduled segments of work produces a time-phased plan against which actual performance can be compared. The establishment, maintenance, and use of such a plan are extremely important aspects of performance measurement. Good planning demands thoroughness and discipline at the outset and continuing discipline is required to maintain

and operate the plan. This does not mean that the system must be totally inflexible but that changes to the time-phased budget plan must be controlled in a disciplined manner.

- a. While planning is required at all levels of management, it becomes progressively more detailed and finite at lower levels of the organizational structure and the CWBS. Usually, all the work for a given contract cannot be planned in terms of detailed work at the outset. However, it can and should be initially divided into larger segments so that the entire contract requirement may be viewed as a sum of identified parts.
- b. When it is clearly impractical to plan all authorized work initially in cost accounts, budgets for the work should be assigned to higher CWBS and organizational levels for subdivision to the cost account level at the earliest opportunity. The budget for this effort must be identified specifically to the work for which it is intended, be time-phased, and be controlled to insure that it is not used or transferred for accomplishing other work. Eventually, all the work to be performed will be budgeted by specific organizational elements to the appropriate cost accounts (See Figure 4). The key point pertaining to summary level planning is that it is no substitute for early and definitive planning at the cost account level. Without timely work definition and realistic budget allocation, the validity of the performance measurement baseline is questionable.
- c. In the case of authorized unpriced work, the contractor should plan and budget near term effort in cost accounts while the remaining

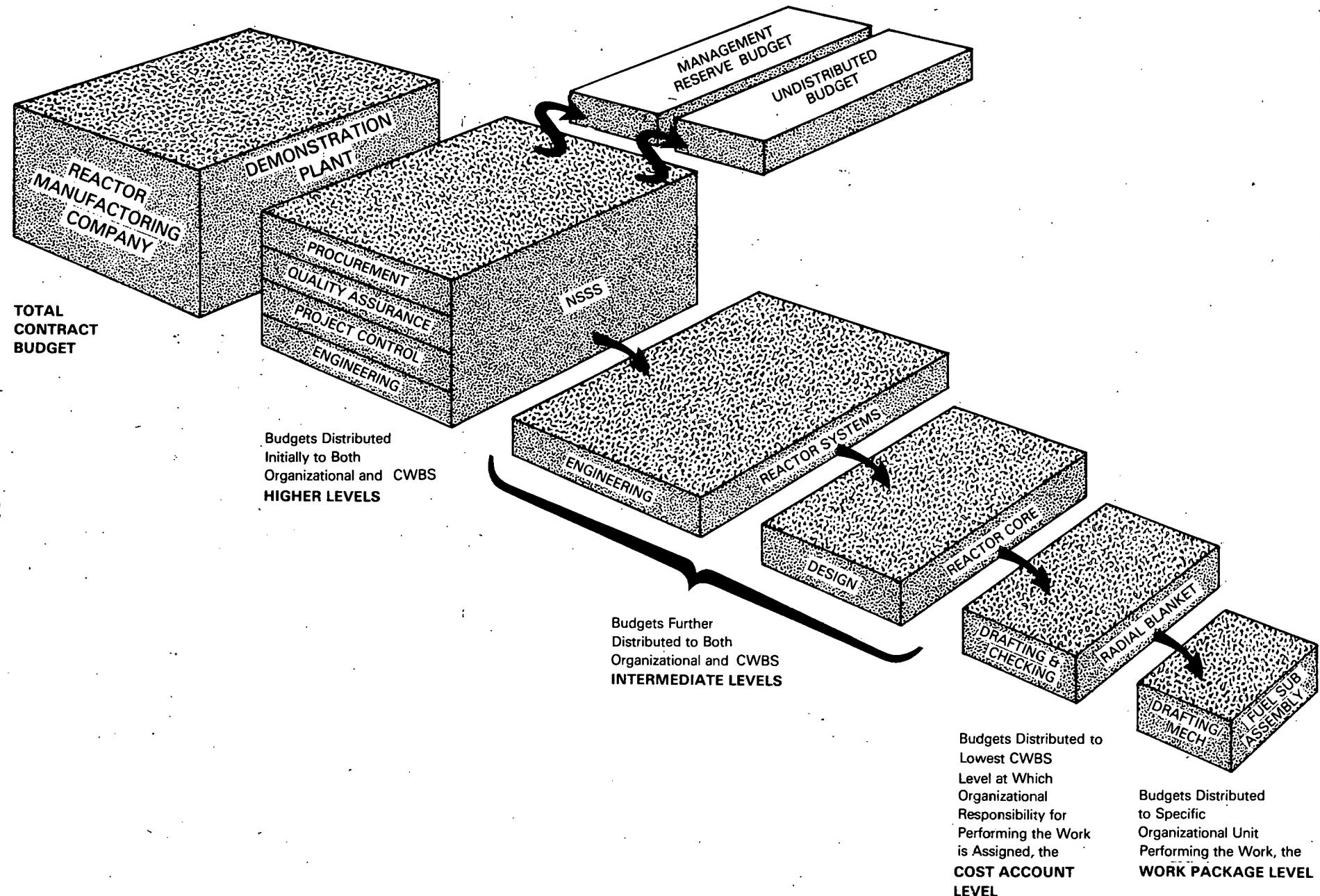


FIGURE 4 REPRESENTATIVE CONTRACT BUDGET DISTRIBUTION

effort and budget may be planned at a higher level. After negotiation, the remaining effort will be planned and budgeted within cost accounts as soon as practicable to assure disciplined baseline planning.

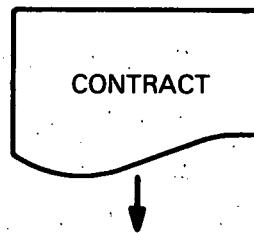
2. Work Authorization. Before work actually begins, the contractor's work authorization system should define and identify the work to be done by the organizational elements responsible. Schedules and budgets should be established for all work. Documents to accomplish these activities generally are already available in the contractor's systems at appropriate levels within the framework of the CWBS. These documents may have a variety of names and may serve more than one purpose, e.g., one document may transmit the authorization to both plan and perform the work. Figure 5 shows typical documents used by contractors to authorize work from the contract level to the work package level.

3. Scheduling. The scheduling system should include all specific work to the lowest defined element of the CWBS in a way which is compatible with contract milestones and meaningful in terms of the technical requirements of the contract. The schedules within the scheduling system should identify key milestones and activities which recognize significant constraints and relationships. The milestones must be objectively measurable. The contractor's scheduling system should interface with other planning and control systems to the extent necessary for measurement and evaluation of contract status. The scheduling system should provide current status and forecasts of completion dates for scheduled work. The contractor's summary and detailed schedules should enable a comparison of planned and actual accomplishment based on milestones or other indicators used by the contractor for control purposes.

a. The Criteria do not require the use of a specific scheduling system

DOE Project Office Work Authorization.

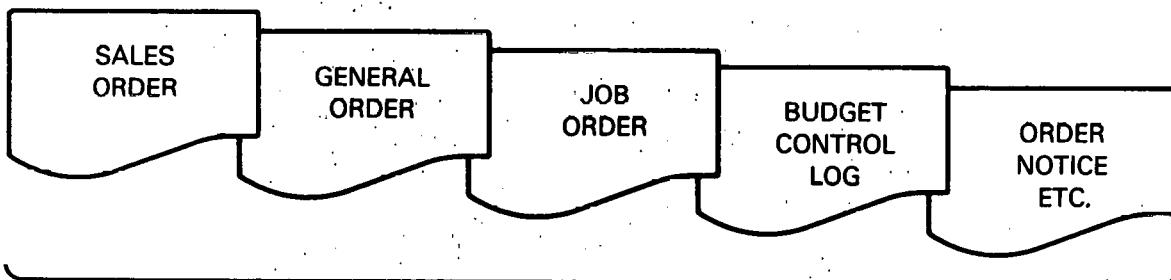
Authorization to Contractor to Perform to Contract Statement of Work



Typical Contractor Top Level Internal Work Authorization.

Authorization to, e.g., Contractor's Project Manager, to Perform Contract Planning, Budgeting, and Scheduling

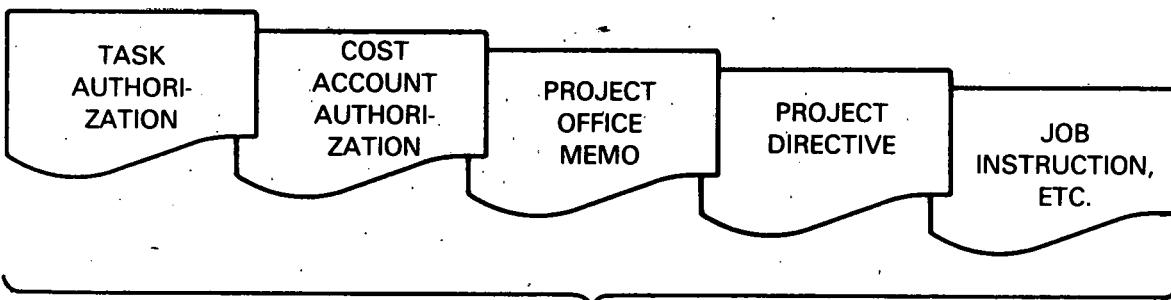
EXAMPLES:



Typical Contractor Intermediate Level Internal Work Authorization.

Authorization from Contractor's Project Manager to, e.g., Cost Account Manager, to Plan, Budget, and Schedule Cost Account Scope of Work

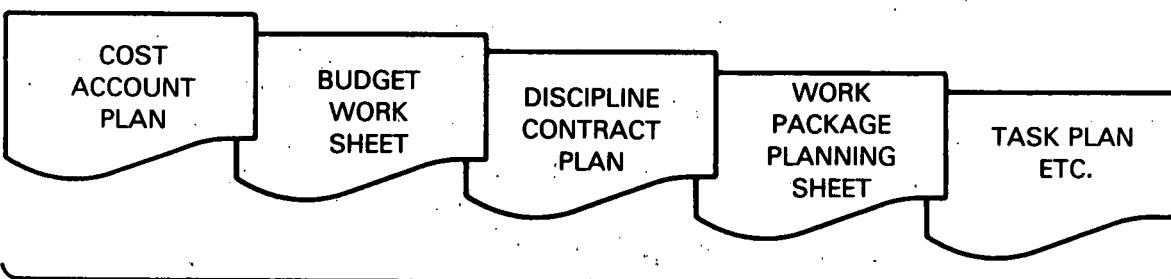
EXAMPLES:



Typical Contractor Cost Account Level Work Authorization to Cost Account Manager.

Authorization to Perform Work and Charge the Cost Account

EXAMPLES:



Typical Contractor Detailed (Work Package) Authorization.

Authorization from Cost Account Manager to Supporting Organizational Units to Perform Specific Tasks and Charge to the Cost Account

EXAMPLES:

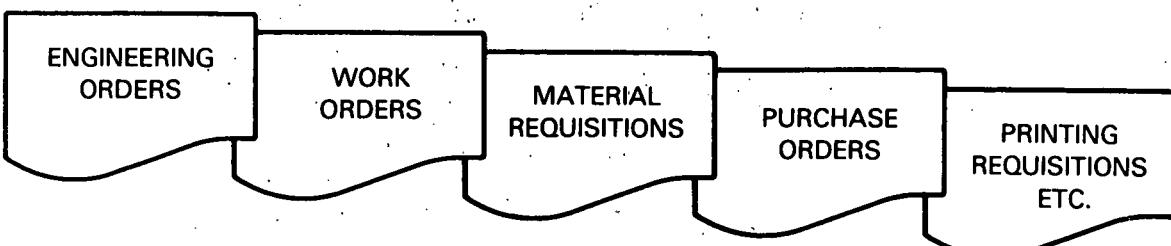


FIGURE 5 TYPICAL CONTRACTOR WORK AUTHORIZATION DOCUMENT FLOW

or methodologies. Basically, the Criteria require the contractor's scheduling system to be formal, complete, and consistent. It should contain a summary or master schedule and related subordinate schedules which provide a logical sequence from the contract level to the work package level. Various scheduling techniques are available which will satisfy these requirements. Networking or critical path techniques may be used at summary and intermediate levels and be supported by bar charts or other techniques at the work package level, if desired, provided adequate and clear relationships exist between successive levels. Figure 6 illustrates a typical scheduling hierarchy and how the contractor's schedules are an extension of the DOE project master schedule.

- b. The schedule indicators used to measure progress must be meaningful and occur with sufficient frequency to provide a basis for accurate measurement of accomplishment. This requires provision for monthly performance measurement to support the determination of cost and schedule performance status at the cost account level. Any rescheduling must be constrained so as to maintain consistency with key schedule dates and changes should not be made to the budgets or values assigned to performance measurement indicators which are scheduled to occur in the current monthly accounting period. Procedures should be established which provide the necessary constraints to maintain performance measurement baseline stability and integrity.
- c. To achieve efficient day-to-day workloading of the performing organizations and to reflect current schedule priorities, work may be rescheduled prior to its scheduled start date. This process, however,

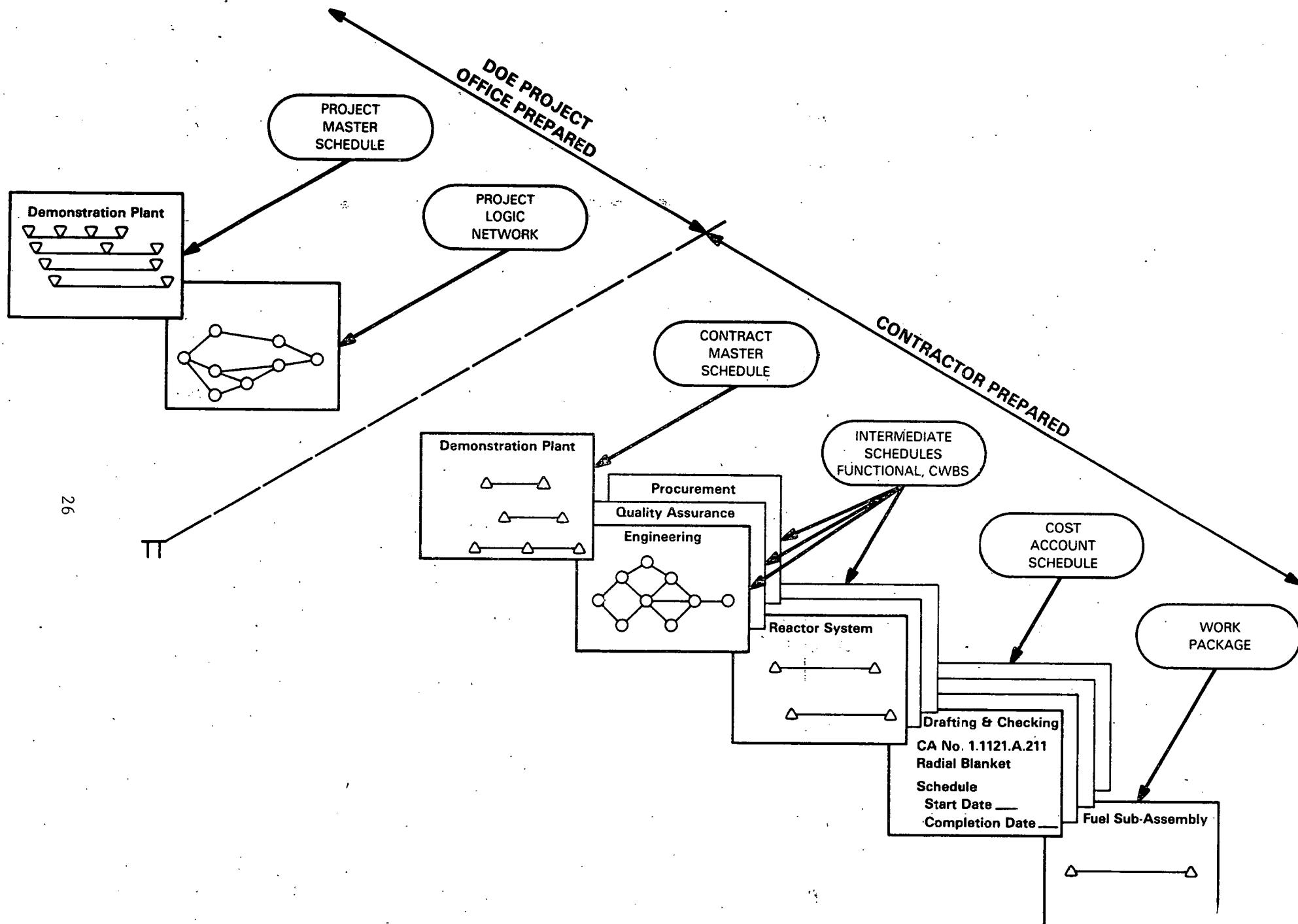


FIGURE 6 TYPICAL SCHEDULING HIERARCHY

must be controlled to avoid problems in satisfying the requirements for advance planning and maintenance of integrated schedules. Further, the closing of in-process work packages (i.e., those affected by the change) and opening of new work packages for each contract change generally does not constitute a practical or economical approach. Under these conditions, rescheduling of the affected work-in-process may be appropriate and acceptable, providing procedures are in existence which prevent the inadvertent invalidation of baseline schedules through these detail-level changes. The substance of such procedures should be to limit the range of rescheduling so as to maintain consistency with key schedule dates on the intermediate and master schedules. The measurement of performance through the use of objective indicators does not eliminate the requirement for detailed planning and control of work. This is essential if schedules and efficient performance are to be maintained. Examples of objective indicators for measuring accomplishment of work may include: the use of milestones with assigned or readily determinable budget values; direct measurement of accomplishment in terms of units of work; a form of equivalent or earned unit measurement system; or an input-output measurement system which compares planned levels and actual performance. A contractor who already has an effective means of measuring performance normally can continue to use that means and should be able to satisfy the Criteria, provided that the measurement is integrated with the baseline plan for the performance of the work.

- d. The contractor must have a baseline plan which reflects the integration of the budgets and the schedules for the planned work. The budgets for the work planned must be time-phased in accordance with the schedule

for the performance of the work. The performance measurement indicators (milestones, earned units, scheduled output, etc.) must be clearly identified and directly traceable to cost accounts. They must be scheduled in a sequence which supports the achievement of higher level schedules, including those specified for the cost accounts. The indicators must clearly represent the accomplishment of an identifiable quantity of work within the cost account and be assigned a value reflecting the planned cost of that work. These values must summarize or reconcile to the total budget for the cost account. The use of an earned value technique which is only generally indicative of some progress (e.g., equal value milestones not related to specific work) is not acceptable.

4. Budgeting. Planning and scheduling the contract work provides the basis for developing budgets and work authorizations. As the work is progressively defined in greater detail, budgets for the planned and scheduled work should be concurrently assigned. Budgets at the work package or cost account level may be stated either in dollars, manhours, or other measurable units; budgets for cost accounts and higher levels are normally expressed or summarized in dollars.

In general, the contractor's budgeting systems should provide for:

- o Direct budgets allocated to the organizations responsible for performing the planned work identified to CWBS elements;
- o Indirect budgets allocated to specific organizations having responsibility for controlling indirect costs;
- o Separate identification of any management reserve budget and undistributed budget; and
- o The total of direct and indirect budgets, management reserve budget, and undistributed budget equaling the current negotiated contract cost plus the estimated cost of authorized unpriced work.

Since primary budget assignments may be made to functional organizations, the level at which the organizational and CWBS elements are integrated may be the first point at which budgets are specifically assigned to CWBS elements. This is not always the case. Certain elements of the CWBS may have budgets assigned at the summary level and then subdivided as the work is broken down into manageable units of effort. Regardless of the budgeting technique used all work eventually receives a budget. The sum of the budgets for all CWBS elements at any one level of the CWBS must be equal to or greater (if indirect costs are applied at the higher level) than the sum of the budgets at the next lower level. The same rule applies at all levels of the organizational structure.

5. Contract Budget Base. The original budget established for elements of the CWBS should constitute a traceable basis against which contract growth can be measured. The starting point or base on which these original budgets are built is the original negotiated contract cost. In the absence of a negotiated value, the contract budget base may be those costs formally recognized by both DOE and the contractor as the value to be used for contract performance measurement purposes. In either case, for Criteria purposes, this is called the contract budget base. The contract budget base increases or decreases only as a result of changes authorized by the Cognizant Contracting Officer. For definitized changes, the contract budget base increases or decreases by the amount negotiated for those changes. For authorized work which has not been negotiated, the contract budget base increases or decreases by the amount of cost estimated by the contractor for that effort. After negotiations, the contract budget base is adjusted to reflect any change resulting from the negotiations. The contract budget base, therefore, is a dynamic and controlled amount, changing as the authorized work under the contract changes. Figure 7 displays the contract

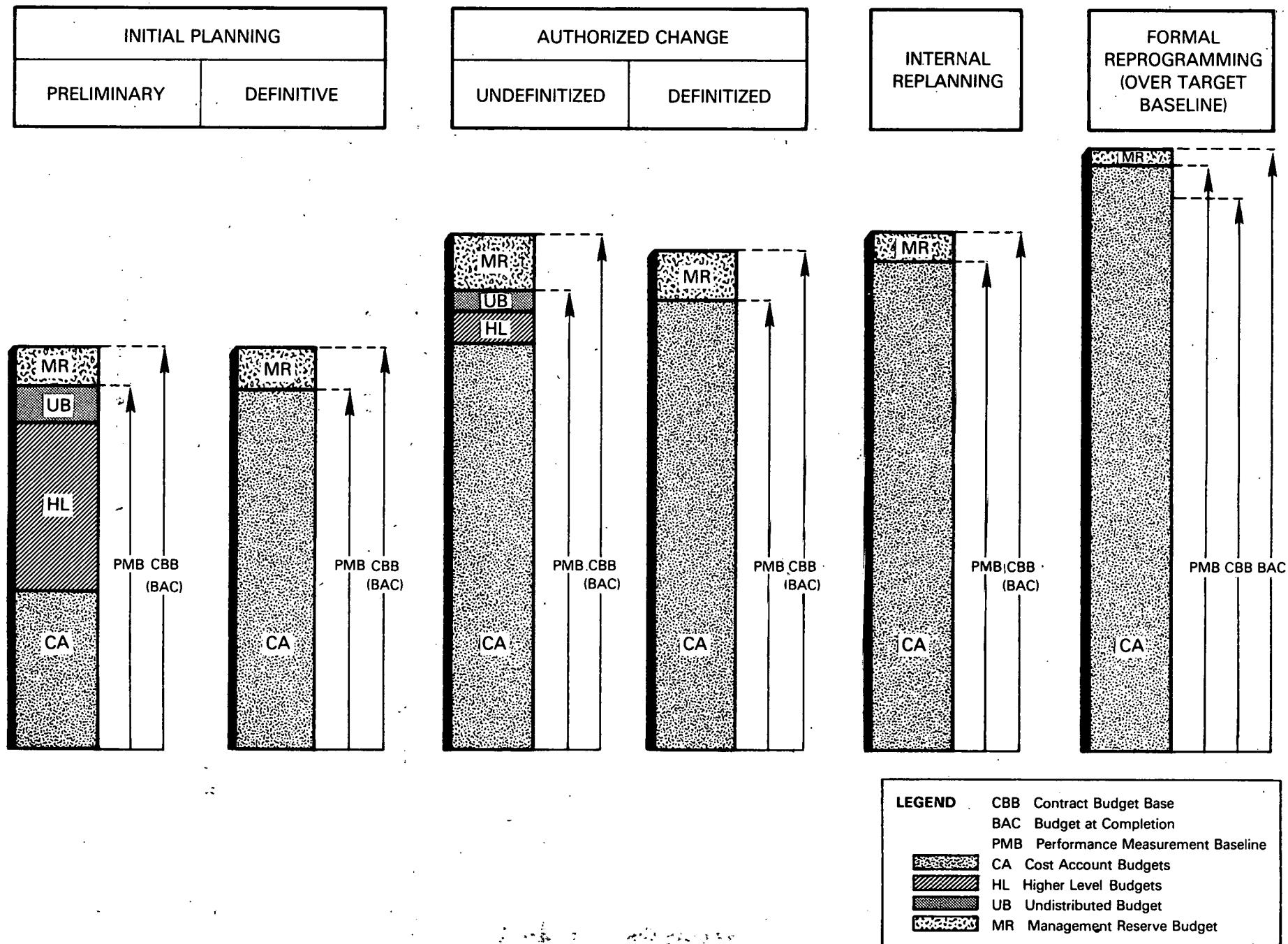


FIGURE 7 CONTRACT BUDGETING ACTIONS

- budget base composition and how it may change under varying conditions.

6. Performance Measurement Baseline. As the contract effort is defined within the CWBS and identified to responsible organizational elements, the basis for budget assignments to identified tasks is provided. Since, normally, all work cannot be planned in detail at the beginning of a contract, initial planning may consist of higher level CWBS work assigned to designated organizational elements for budgeting and scheduling. These higher level work assignments, in effect, serve as planning budgets in the initial planning. Eventually, all budget will be detail planned in cost accounts. The budgets assigned to cost accounts are time-phased in accordance with the schedule for performing that work, thus forming the major portion of the time-phased budget baseline, i.e., the performance measurement baseline, used in the measurement of both CWBS and organizational performance. Within a cost account, further budget assignments are made to work packages, LOE, and apportioned effort, as appropriate, as detailed planning proceeds. Any far term cost account work is planned in larger planning packages for budget and scheduling purposes. These planning packages are then detailed planned per the "rolling wave" approach. When all work is planned within cost accounts, the budgeted work must equal the total cost account budget. For future effort not planned to the cost account level, the performance measurement baseline also includes budgets assigned to higher level CWBS and organizational elements and any temporary undistributed budget (See Figure 7).

a. All cost accounts must contain a budget, schedule, and scope of work and should realistically represent the manner in which work is assigned and budgeted to the organizational units. The cost account

budget should include all direct costs for the total work with separate identification of cost elements (labor, material, other direct costs) as agreed to. Establishing and maintaining control at the cost account level permits flexibility in the management of resources and work replanning. Since cost account budgets and schedules establish the basis for baseline control, cost account duration is a factor in determining the extent of controls required. When cost accounts average no more than one year in length, replanning within the cost accounts can be accommodated without the need for rigid constraints. When cost accounts exceed a year in length, they must be disciplined by budget allocation constraints. It is not intended to limit cost accounts to one year in length, but to ensure that budgeting procedures and practices prohibit budget planned for far term work from being used for other work in the near term.

- b. Replanning of cost accounts is sometimes necessary to compensate for internal conditions which affect the planning and scheduling of remaining work. Such replanning, however, should be accomplished within the constraints of the originally established cost account schedule and budget. When more extensive replanning of future work is necessary and the total cost account budget must be changed, management reserve budget may be used to increase or decrease the cost account budget, providing a record is maintained documenting the transfer. If replanning requires that work and associated budget be transferred between cost accounts, this transfer must also be formal and documented. Except for correction of errors or normal accounting adjustments, no retroactive changes will be made to budgets

for completed work. Replanning actions designed to reduce costs, improve or reflect improved efficiency of operations, or otherwise enhance the completion of the contract are encouraged. Replanning actions which significantly affect the time phasing of the performance measurement baseline should be clearly auditable by review of contractor records and should be reported to the DOE Project Manager. Maintenance of a performance measurement baseline is required to ensure that deviations from plan are visible and that they can be examined to determine their causes.

- c. The contract budget base used to report contract performance to DOE must always represent an amount which is formally recognized by both parties. The objective here is to force recognition of contractual requirements and to preclude undisciplined changes that could result from the use of and reporting against a contractor's unilaterally established base. The initial establishment of the performance measurement baseline should be tied to the contract budget base. As new work is authorized on the contract, the contract budget base and the performance measurement baseline are increased accordingly. Normally, the budget at completion (BAC), i.e., the total allocated budget, will equal the contract budget base.
- d. Nothing in the Criteria prevents the contractor from establishing an internal operating budget which differs from the contract budget. Operating budgets are sometimes used to establish internal targets for rework or added in-scope effort which are not significant enough to warrant formal reprogramming. Such budgets do not become a substitute for the cost account budgets in the performance measurement

baseline, but should be visible to all levels of management as appropriate. Cost account managers should be able to evaluate performance in terms of both operating budgets and cost account budgets in order to meet the requirements of internal management and of reporting to DOE. Establishment and use of operating budgets should be done with caution. Working against one plan and reporting progress against another is undesirable, and the operating budget should not differ significantly from the cost account budget in the performance measurement baseline. Operating budgets are intended to provide targets for specific elements of work where, otherwise, the targets would be unrealistic. They are not intended to serve as a completely separate work measurement plan for the contract as a whole.

- e. Any increase in the BAC in excess of the contract budget base constitutes formal reprogramming and must be formally submitted by the contractor and formally recognized by the DOE Project Manager. This includes documented reconciliation to the contract budget base. It should be clearly understood that such changes are not acceptable on a frequent basis, such as quarterly or semiannually, but may be expected to occur only once or twice during the life of a multi-year contract. One would not expect such an adjustment for instance on a contract with limited duration, e.g., one year.
- f. When a contractor formally requests the DOE Project Manager for a BAC in excess of the contract budget base and the revised plan is accepted for performance reporting, this condition should be an indicator to the Cognizant Contracting Officer that progress payments, liquidation rates, or cost reimbursement fee vouchers may

require review for appropriate adjustment.

7. Undistributed Budget. Within the performance measurement baseline, the budget not identified to both a responsible organization and a CWBS element is designated as undistributed budget. This type of budget primarily results because it cannot be specifically allocated to cost accounts. The provisions for undistributed budget are to accommodate temporary situations where time constraints prevent adequate budget planning or where contract effort can be defined only in very general terms. Undistributed budget should not be used in lieu of proper contract planning. This budget should be formally allocated to cost accounts as quickly as practicable, as described below, to maintain the integrity of the time-phased performance measurement baseline. Usually, the establishment of undistributed budget will occur when:

- a. Contract changes are authorized. For example, reporting deadlines may preclude the planning of newly authorized work prior to report preparation. However, since budgets for all authorized contract work must be accounted for, some provision for the budget applicable to contract changes must be made. In such cases, undistributed budget identified to the specific contract changes may be established. Except as provided in (b.) below, the budget should be distributed to appropriate cost accounts by the end of the next reporting period.
- b. Authorized work has not been negotiated. For example, the contractor may maintain budget in an undistributed budget account until negotiations have been concluded, allocating budget only to that work which will start in the interim. After negotiations, the remaining budget will be allocated appropriately.

8. Management Reserve Budget. In many major acquisition contracts, it may be difficult to foresee and plan all in-scope work. The Criteria permit use of a contractor management reserve budget, provided that records are maintained on its use. The amount of management reserve budget and any application must always be accounted for by the contractor and reported to DOE at the total contract level. Normally, it is controlled at the contract level, although in some cases it might be distributed for control at lower management levels. In any event, the management reserve budget is maintained separately from the performance measurement baseline and is identified separately from undistributed budget. Also, there is no "negative" management reserve budget. If the contract is budgeted in excess of the contract budget base, the provision for formal reprogramming applies.

9. Economic Price Adjustment. For those contracts which recognize abnormal escalation by use of price adjustment clauses, the amounts related to these clauses can be treated in essentially the same manner as undefinitized changes. If it can be foreseen that economic conditions may result in contract cost revision under the economic price adjustment clause, the contractor may estimate the amount of the adjustment to be received at the end of the specified economic price adjustment period or other period agreed to by the contracting parties and include that amount in the contract budget base. Distribution of the estimate will be made to the performance measurement baseline and/or management reserve budget and the distribution reported in the Cost Performance Report and Project Status Report. As the contract proceeds and amounts applicable to economic price adjustment are definitized, the contract budget base is adjusted to reflect both these changes and the contractor's latest estimated cost adjustment for the next economic price adjustment period. At all times the economic price adjustment estimate should be identified to contract specified periods and reflect

actual experience, current trends, and a reevaluation of future conditions. Thus, the performance measurement baseline can reflect the economic price adjustment conditions contained in the contract, and performance can be measured against a more realistic plan. At the contract level, estimates for economic price adjustment will be identified and reported separately from estimates for unnegotiated changes. No matter what period is chosen for inclusion of the estimate in the contract budget base, the estimate and definitized values should be specifically identified and reported by the time periods specified in the economic price adjustment clause. The purpose is to properly identify what was definitized versus what was estimated. This identification is necessary for tracking estimates and tracing adjustments to management reserve budget and to the budget for remaining work.

D. ACCOUNTING

The contractor's accounting system must provide for adequately recording all direct and indirect costs applicable to the contract. Such costs must be directly summarized from the level at which they are applied to the contract through both the CWBS and functional organizational structure in accordance with procedures acceptable to the Cognizant Auditor.

1. Direct Costs. The Criteria require the contractor to record direct costs on an applied or other acceptable basis for performance measurement and unit costing purposes. Direct labor costs are normally applied to work-in-process on an as-used (applied) basis. Whenever possible, direct material costs should also be recorded in the same manner; however, in no case will the costs be recorded earlier than the time of actual receipt of the material. If existing contractor accounting systems facilitate cost and schedule performance measurement, they may be accepted even though they do not record material as a direct cost at the point of usage.

a. To be acceptable, contractor material accounting systems should have the following characteristics:

- o An accurate cost accumulation system which assigns material costs to appropriate cost accounts in a manner consistent with the budget;
- o Recognized costing techniques acceptable to the Cognizant Auditor;
- o Capability to establish cost variances attributable to price variance and usage variance;
- o Performance measurement at the point in time most suitable for the category of material involved; and
- o Full accountability for all material purchased for the contract, including the residual inventory.

The first two characteristics are within the province of the Cognizant Auditors in their normal activities or as participants on systems reviews. With regard to material accounting, the contractor must be able to account for all contract material, including subcontract material, and purchased parts which, by their value and significance, warrant such attention. It is not cost effective to require individual identification of such items as small hardware, miscellaneous wiring materials, and other items of a similar nature.

b. Material price variance is an essential element of material cost control. This can be determined early in the cycle of ordering material, at which point the price of the material can be compared with the amount budgeted for that material. Accumulation of these differences represents the total material price variance. Various methods can be used to calculate this variance, but the system should readily provide such data. When it becomes known that actual

material costs will vary from the amounts planned, the contractor should immediately reflect these differences in the estimate at completion for the material.

c. Material usage variance is an important cost factor on repetitive type jobs, but may be of marginal significance on a contract for one-of-a-kind R&D equipment. Although the final material usage variances are not available until the work is completed, acceptable cost accounting techniques for analyzing and determining current and projected usage variances should be applied to provide continuing internal measurement whenever the value and nature of the material warrants. The Criteria require that contractors' systems be capable of formally planning and tracking the cost of material usage. For most contractors, purchases of material in excess of bill of material requirements are standard practice for many categories of material. Planning for material usage allowance to cover scrap, test rejections, unanticipated test quantities and the like, is a practical necessity and the contractor should have records of such provisions. The more uncertain the expected usage, the more important it is to have a good plan and to keep track of performance against it, particularly for contract-peculiar materials or materials which require long procurement lead times.

d. In those instances where the contractor maintains separate stores inventory areas, actual or applied direct costs of "store" material or components will be relieved from the inventory account and charged as actual direct cost on the contract when issued. Normally, all unused material should be returned to stores for disposition. Actual

direct material cost includes the materials in the final product, scrap, damaged materials plus any material which was purchased for the contract but not used, and for which an alternate use cannot be found. However, cost projections for follow-on procurement, would be expected to include material consumed plus material requirements for schedule assurance based on waste and spoilage trends determined from an appropriate phase of the contract performance.

- e. Actual material resources expended must be recorded on the same basis as their budget assignment, if meaningful comparisons are to be made. The definition of applied direct costs takes into consideration the different types of material involved in a contract. Not all material items are processed through inventory accounts. High-dollar value items such as major components or assemblies are frequently scheduled for delivery in accordance with the assembly line schedule or site need dates. Items of this type are not usually scrapped if found defective, but are returned to the supplier for rework or repair. Actual direct costs for such material may be recorded upon receipt, payment, or usage, as appropriate under the contractor's system.
- f. Neither the applied direct cost approach nor any acceptable alternate should be interpreted to relieve the contractor of the need to maintain records of contract commitments for material. To avoid distortion of cost variances, costs of material should be reported as incurred in the same period in which BCWP is earned for the material. For situations where BCWP is earned and the associated

invoice has not been paid, the estimated actual cost may be incorporated into ACWP from the invoice or from purchase order information.

2. Indirect Costs. The contractor should charge indirect costs to appropriate overhead pools by methods acceptable to the Cognizant Auditor. Controls of indirect costs are required and should include:

- o Establishment of realistic time-phased budgets by organizations, e.g., department or cost center;
- o Placement of responsibility for indirect costs in a manner commensurate with an individual's authority;
- o Monthly variance analyses and appropriate action to eliminate or reduce costs where feasible; and
- o Review of budgets at least annually and when major unforeseen variations in work load or other factors affecting indirect costs become known.

After indirect costs are accumulated and allocated to contracts, they are applied at the CWBS and organizational level selected by the contractor. However, it must be possible to summarize indirect costs from the applied level to the contract level without further allocations.

E. ANALYSIS

The Criteria set forth the characteristics which contractors' systems must possess and specify the type of data which should be derived from the systems and reported to DOE. This section discusses the data elements identified in the Criteria and their associated variances. It also includes discussion of technical achievement and its impact on cost and schedule performance measurement.

1. Budgeted Cost for Work Scheduled (BCWS). BCWS represents the time-phased budget plan (performance measurement baseline) against which performance is measured. For the total contract, BCWS is normally the contract budget base less any management reserve budget. It is time-phased by the assignment of budgets to scheduled increments of work. For any given time period, BCWS is determined at the cost account level by totaling the budgets for all discrete work scheduled to be completed, plus the budgets for the portion of in-process discrete work scheduled to be accomplished, plus the budgets for LOE and apportioned effort scheduled to be completed during the period. In developing the BCWS, consideration should be given to the methods planned for determining BCWP and for recording ACWP.

2. Budgeted Cost for Work Performed (BCWP). BCWP (earned value) consists of the budgeted costs for all work actually accomplished during a given period. At the cost account level, BCWP is determined by totaling the budgets for work actually completed, plus the budgets applicable to the completed in-process work, plus the budgets for LOE scheduled for the period and the appropriate value for apportioned effort associated with completed work. The Criteria do not specify any particular method to measure earned value because the technique used will largely depend on the work scope, value, and duration. The major difficulty encountered in contractor determination of BCWP is the evaluation of work-in-process. Some contractors use short-span work packages or establish discrete value milestones for longer duration work to reduce the work-in-process evaluation and facilitate objective earned value measurement. Others use formulae or earned standards for determining BCWP, while still others prefer to make physical assessments of work completed to determine the applicable budget earned. The use of arbitrary formulae should be limited to work packages of relatively short duration, e.g., two months or less. In all cases, BCWP should be

calculated in the same manner BCWS was developed.

3. Actual Cost of Work Performed (ACWP). ACWP is the sum of costs actually incurred in accomplishing work within a given time period and recorded at the cost account level. The composition of ACWP must be consistent with the costs originally budgeted for the cost accounts. This rule also applies for any higher level of either the CWBS or organizational structure. If indirect costs, for example, are included in ACWP at a given level, their budgets must also be included in BCWS and BCWP at the same level.

4. Budget at Completion (BAC). At the cost account level, the BAC is the total authorized cost account budget. This budget changes to reflect contract changes, internal replanning actions, application of management reserve budget, or application of undistributed budget. When the cost account budgets are added to the management reserve budget and undistributed budget, the contract BAC results. The contract BAC normally equals the contract budget base and provides a reference for comparison with the contract estimate at completion.

5. Estimate at Completion (EAC). The Criteria require the contractor to develop periodically comprehensive estimate of costs at contract completion. In developing the estimate, the contractor should use all available information, including reestimating quantities and costing all remaining work to arrive at the best possible time-phased estimate of costs for all future effort. This is necessary to insure that resource requirements are realistic and time-phased in accordance with projected performance. The procedure for EAC development should be systematically and consistently used with adequate consideration given to performance to date. In addition, the cost account EAC should be routinely examined monthly and should be updated as warranted. Such an examination

is required to assure reliable and timely EAC status reporting consistent with contractor reporting requirements. Both the comprehensive EACs and the cost account updates are essential as a basis for management decision-making by both the contractor and DOE managers. Although no specific time period for developing the comprehensive EAC is established by the Criteria, it is expected that a comprehensive estimate will be prepared on an annual basis as a minimum, usually in support of current and future year funding requirements, or more frequently whenever performance relative to the budget at completion (BAC) or variance thresholds, or other known factors indicate that the current estimate is invalid. The EAC submitted to DOE on the Cost Performance Report must be reconcilable with internal cost reports and the contractor's latest statement of funding requirements reported to DOE. EACs should be established without regard for contract ceilings.

6. Data Analysis. Contractor data analysis is initiated at the cost account level by the responsible manager. Cost, schedule, and at completion variances that exceed established thresholds require review and analysis to determine the cause, to evaluate options to resolve the situation, and to report actions (taken, planned, or proposed) to higher level management.

- a. The comparison of BCWP with ACWP shows whether completed work has cost more or less (cost variance) than was planned for that work. Analysis of the cost variance should reveal the contributing factors to the variance, such as poor initial estimate for the task, technical difficulties requiring application of additional resources, the cost of labor or materials different than planned, personnel efficiency different than planned, or a combination of these or other reasons.

- b. The comparisons of BCWP with BCWS relates work completed to work scheduled during a given period of time. Their difference represents a schedule variance. While the schedule variance provides a valuable indication of schedule status in terms of dollars worth of work accomplished, it may not in all cases clearly indicate whether or not scheduled milestones are being met since some work may have been performed out of sequence or ahead of schedule. A formal time-based scheduling system must therefore provide the means of determining the status of specific activities and milestones.
- c. Comparisons of BAC with EAC represent a forecast of budget overrun or underrun (at completion variance). Analysis of this variance should identify the possible causes such as redesign, change in scope, unrealistic EAC or BAC, lack of proper controls, or a combination of these or other reasons.
- d. Comparisons of BCWP with BCWS and with ACWP, and of EAC with BAC, are required at the cost account level. Since cost accounts are the responsibility of a specific individual within a single functional organization, managerial authority and responsibility for corrective action should exist at this point making the cost account a key management control point in the contractor's system. It is important that the performance measurement baseline be maintained at this level and that higher level management information consist of direct summaries of cost account data. Comparisons of planned versus actual performance are of little value if the measurement base is subject to uncontrolled change or if cost account managers lack the responsibility and authority for corrective actions.

- e. When a subcontractor is required to comply with the Criteria and provides a Cost Performance Report and Project Status Report, subcontractor data are readily available to the prime contractor for performance measurement purposes. If a critical subcontractor is not required to comply with the Criteria, the prime contractor should establish procedures which tie the subcontractor's planned and actual accomplishment (BCWS and BCWP) to valid indicators, such as the proposed payment schedule or completion of identified work segments.
- f. It is unnecessary and would prove unproductive to analyse every cost and schedule variance. Therefore, the contractor should establish internal cost and schedule variance thresholds and analyze only those variances which are significant, i.e., those which exceed the thresholds. These internal thresholds may vary with respect to the level of the CWBS element, the level of the organizational element, the risk involved, the amount of work remaining, and the thresholds negotiated for reporting to DOE. It is essential that these internal variance thresholds be reviewed periodically in order to assure that all significant variances are analyzed for reporting to DOE, while avoiding an excessive number of internal variance analyses.

7. Summarization. BCWS, BCWP, ACWP, BAC, EAC and associated variances should be summarized directly from the cost account level up through both the CWBS and organizational structures in order to provide both contract status and organizational performance at all levels of management (see Figure 8). Because favorable variances in some areas are offset by unfavorable variances in other areas, higher level managers will normally see only the most significant variances at their level. On the other hand, the accumulation of many small variances,

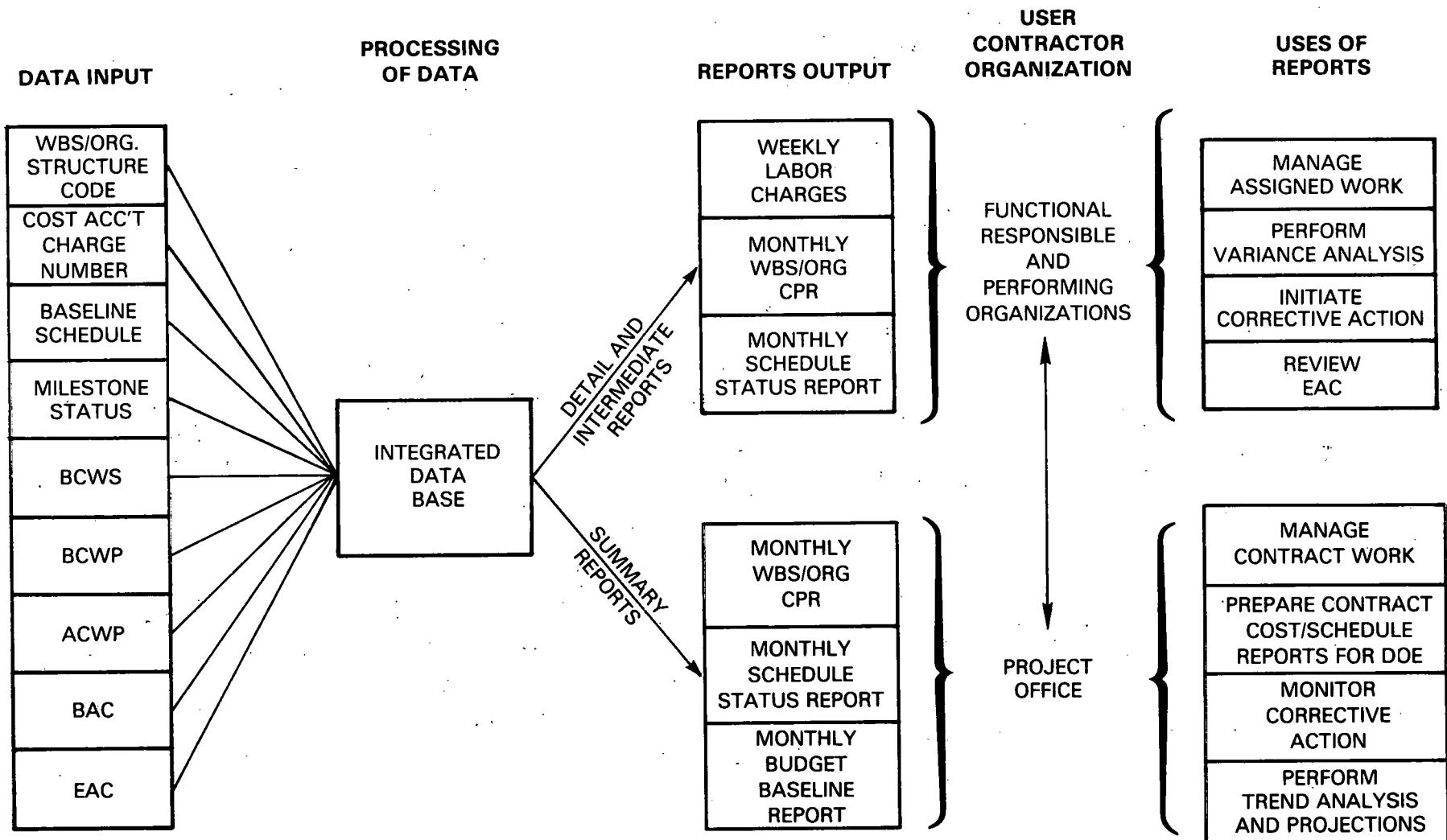


FIGURE 8 SAMPLE CONTRACTOR DATA FLOW FOR PERFORMANCE MEASUREMENT

not attributable to any single major difficulty, add up to a significant overall schedule or cost problem and will be evident. The same is true of the information to be reported to DOE.

- a. The Cost Performance Report provides data to DOE at a summary level, normally the third level of the Contract WBS or higher. Functional cost information may be reported at the total contract level for major functional categories which reflect the contractor's organizational structure. The cost or schedule variances that appear on this report and exceed the negotiated thresholds should be explained in the Project Status Report. The reasons for reporting only summary level information to DOE is that as long as contract performance is proceeding according to plan, there should be no need to report additional detail. If performance begins to deviate from the plan, the contractor's system should provide the capability for tracing the variances to their source in order to isolate the causes of the deviations.
- b. It should be recognized that this method of performance measurement is only one of the management tools available to contractors and DOE. Many problems will be disclosed through methods other than the monthly contractor performance reporting. For example, the contractor's failure to meet planned cost, schedule, or technical requirements should be readily apparent and promptly lead to corrective action. However, the reports to DOE should indicate the overall cost impact of such problems on the contract.

8. Technical Achievement

- a. A key to effective cost and schedule control is correlation of technical achievement with accomplishment of specific work. If the Project

Summary WBS and the related Contract WBS reflect the manner in which the contractor actually plans to do the work, this correlation is greatly simplified. When unfavorable cost and/or schedule variances are caused by technical difficulties, the quantitative variance information in the Cost Performance Report should be supplemented by a narrative in the Project Status Report to explain the technical problems encountered and their impact.

- b. As work on a contract progresses, the contractor determines the adequacy and quality of the work performed by inspections, tests, or other types of technical measurements. If the technical results are satisfactory and no corrective action is required, the work is allowed to proceed further. If, on the other hand, deficiencies are found, the contractor considers various alternatives for corrective action, e.g. , redesign, scrap and remake, rework. When considering these alternatives, the impact on cost and schedule are weighed in addition to the technical considerations. One or more of the alternatives may be selected as the planned course of action to obtain the technical results desired. As the replanned work is accomplished, the contractor's performance measurement reports will document the increasing variances. Thus, there is a close relationship between technical achievement and its impact on cost and schedule.

F. REVISIONS AND ACCESS TO DATA

The final section of the Criteria pertains to revisions to planning which are necessitated either by contractual change or by internal conditions which

require replanning within the scope of the contract. It also deals with maintaining the validity of the performance measurement baseline, and with government access to contractor data.

1. Contract Changes. DOE directed changes to the contract can impact virtually all aspects of the contractor's internal planning and control systems, including the CWBS, work authorizations, budgets, schedules, and estimated costs at completion. Contractors should incorporate contract changes authorized by DOE in a timely manner. Revisions to systems documentation (e.g., schedules, work authorizations, etc.) should be accomplished as soon as possible, but in any case within 30 to 60 days of receipt of the change authorization.

- a. Where the change has been negotiated and priced, budget revisions are based on the negotiated cost of the change. Where work is authorized prior to negotiations, appropriate replanning will be accomplished and budgets will be established based on the contractor's cost estimate for the change. The adjustment of budgets to reflect negotiations may be accomplished by revising the undistributed budget identified for the change, the management reserve budget, budgets established for work not yet started, or a combination of these.
- b. The budgets associated with near-term work should be well planned, and retroactive changes to budgets for completed work associated with the change are prohibited. Adequate records of all budgeting changes should be maintained to provide the basis for reconciliation with original budgets at the lowest level of the Project Summary WBS as a minimum.

2. Internal Replanning. During the course of the contract, it may be necessary for the contractor to perform replanning actions within the scope of the authorized contract to compensate for cost, schedule, or technical problems

which have caused the original plan to become unrealistic, require a reorganization of work or people in order to increase efficiency of operations, or require different engineering or fabrication approaches than originally contemplated.

- a. Due to the importance of maintaining a valid performance measurement baseline, internal replanning changes should be accomplished in a systematic and timely manner and should be carefully controlled and documented. Many such changes can be handled within the budget and schedule constraints of the cost accounts involved. Other changes may require the application of management reserve budget to cost accounts to cover additional costs estimated as a result of work changes (See Figure 7). All changes which affect cost account budgets or include significant schedule revisions which impact the time-phasing of the performance measurement baseline, should be documented internally by the contractor and reported to the DOE Project Manager in the Project Status Report. This requirement is intended to assist all users of the data produced from the management systems in understanding and interpreting it correctly.
- b. If the contractor proposes a change to budgets for either completed or in-process work (e.g., an adjustment for indirect cost application), the Cognizant Contracting Officer, in conjunction with the DOE Project Manager, should promptly and thoroughly evaluate the proposed change and its effect on contract performance measurement prior to DOE approval of the change. The agreement with the contractor should address the specific adjustments to be made and the time period during which the change will be implemented. The change will not be made prior to DOE approval.

3. Formal Reprogramming. During the life of a contract, situations may arise whereby available contract budgets for the remaining work are decidedly insufficient. Consequently, contract performance measurement against the available budgets becomes unrealistic and contractor reprogramming (i.e., comprehensive replanning) may be necessary. This may result in the contractor adding budget to the performance measurement baseline which, in turn, causes the BAC to exceed the DOE authorized contract budget base. If this condition occurs, the contractor is measuring performance to an "over target budget baseline" rather than the contract plan represented by the contract budget base (See Figure 7).

a. A thorough analysis of contract status requiring the full coordination of both the contractor and DOE is mandatory prior to DOE recognition of a BAC in excess of the contract budget base. The contractor must develop a detailed estimate of all cost necessary to complete the contract. Factors to consider in developing the estimate are the amount of authorized work remaining, the estimated cost of the resources required to accomplish the remaining work, and the budget (including management reserve budget, if any) available for reallocation to the remaining work. If the difference between the revised estimated cost to complete and the remaining budget is a significant amount, the contractor will request the DOE Project Manager to recognize the increase in the remaining budgets thereby permitting subsequent performance to be measured against a total contract goal higher than the contract budget base. Before making a decision as to whether to recognize the contractor's request, the DOE Project Manager should perform an analysis of the contract work remaining and the budget remaining to verify the situation. Guidance on formal reprogramming also should be obtained from the Controller. A contractor's request

for formal reprogramming merely to compensate for variances already experienced should not be approved.

- b. As appropriate, contractor formal reprogramming may entail replanning future work and in-process work. The cumulative variances (cost or schedule or both) may also be adjusted on a one-time basis in establishing the revised performance measurement baseline. Such reprogramming will permit the contractor to increase the amount of budget for the remaining work to a more realistic amount, adequate to provide reasonable budget objectives, work control, and performance measurement. Establishment of a management reserve budget for the reprogrammed work is not precluded.
- c. If the DOE Project Manager is satisfied that the contractor's formal reprogramming represents an acceptable plan for completing the contract work, the proposed performance measurement baseline may be recognized as a basis for future performance measurement. Timeliness is essential in making this determination. Therefore, the DOE Project Manager should take quick action to evaluate:
 - o The impact on contract status reporting, such as the effect on cost and schedule variances and the change in the relationship of BCWP to the contract value;
 - o The method to be employed by the contractor in implementing the change, e.g., adjustments to variance applicable to completed work, and/or adjustments to work-in-process;
 - o The estimated amount of time required to accomplish the reprogramming and the effect on performance measurement during that time; and

- o The effect on other contractual commitments, e.g., the status of contractually specified project milestones, the contract share ratio, and the liquidation rates for progress payments.
- d. After DOE recognition of the formal reprogramming, the contractor must document the changes made to the performance measurement baseline to assure budget traceability. Appropriate internal records and reports must be revised expeditiously to account for the manner in which the budgets were changed. If variances are adjusted, the BCWS and BCWP values prior to adjustment will be retained to assure traceability.

4. Baseline Maintenance. In order to maintain the validity of the performance measurement baseline, discipline is mandatory throughout the contractor's organization, particularly with respect to budgetary control. Contractor's written internal procedures should clearly delineate acceptable budget practices. These procedures should include the following provisions:

- o Budgets must be assigned to specific segments of work as appropriate (higher level organizational and CWBS elements, cost accounts, work packages, planning packages);
- o Work responsibility must not be transferred from one cognizant organization to another, or from one cost account to another, without transferring the associated budget;
- o A budget assigned to future specific tasks or planning packages must not be used to budget another task, regardless of the CWBS level involved;

- o When management reserve budget is used, records should clearly indicate when and for what purpose it was applied;
- o When undistributed budget exists, records should clearly identify its amount, source, the CWBS or organizational level at which it is held, and if distributed, when and for what purpose;
- o Budgets assigned to work should not be changed once the work has started unless the scope of work is affected by contractual change or other reasons agreed to by the contracting parties; and
- o Retroactive changes to BCWS, BCWP, ACWP or schedule for completed work should not be made except for correction of errors or normal accounting adjustments.

5. Data Access. The contractor shall provide the Cognizant Contracting Officer and duly authorized representatives access to all of the information and supporting documentation necessary to evaluate the contractor's management control systems initially and throughout the contract life, and to trace to the source the problems indicated in summary level data reported to DOE.

CHAPTER III - DOE ORGANIZATIONAL RELATIONSHIPS

A. INTRODUCTION

Successful CSCSC application requires the coordinated efforts of various organizational elements of DOE. This chapter describes the responsibilities and authorities of DOE organizations concerned with the implementation of the Criteria as well as the composition and responsibilities of review teams.

B. DOE ORGANIZATIONAL RESPONSIBILITIES

1. **Secretarial Officials.** Assistant Secretaries with outlay program responsibilities and the Director, Office of Energy Research, are responsible for assuring that the Criteria are implemented on new major system acquisition projects and for approving recommendations for such implementation on other projects. The appropriate Secretarial Official designates and maintains a focal point for coordination of Criteria matters with the Controller, the overall DOE focal point.

2. **Program Office Directors.** Based on Project Managers' proposals and on their own identification of appropriate projects, Program Office Directors recommend to the appropriate Secretarial Official projects for Criteria implementation and assure that in each case the approved Project Plan forms the basis for or includes Criteria implementation planning. Upon completion of the evaluation of a contractor's systems, the Program Office Director reviews the Project Manager's recommendations for validation or acceptance and forwards it with appropriate endorsement to the Controller.

3. **Field Office Managers.** Field Office Managers support review teams' efforts at contractors' facilities within their purview, as well as surveillance

activities associated with assuring continuing acceptability of contractors' management control systems. They also insure the inclusion of appropriate Criteria requirements in solicitations and in contracts. Each Field Office also designates and maintains a focal point for coordinating Criteria matters with the Controller.

4. Project Managers. DOE Project Managers apply the Criteria on selected contracts supporting major system acquisition projects and on other projects that have been approved for Criteria application. In coordination with the Controller and with the cognizant Program Office, the concerned Project Manager prepares Criteria implementation plans. Such plans identify the contracts which are candidates for full or modified implementation, establish a proposed schedule of review activities, and specify the level of detail for reporting as well as the thresholds requiring variance analysis.

a. The Project Manager ensures inclusion of the Criteria requirements in the solicitation and contractual documents and provides prospective contractors, through the Cognizant Contracting Officer, with required Criteria information. After contractor selection and in coordination with the Controller, the Project Manager appoints the review Team Chief, determines team composition and establishes the schedule for systems review. The Project Manager retains responsibility for overall review conduct. Based on the review team's report, the Project Manager recommends system validation to the Controller through the cognizant Program Office under full Criteria implementation, or notifies the Controller through the Cognizant Program Office of systems acceptance under modified Criteria implementation.

b. Upon validation or acceptance, the Project Manager informs the Cognizant Contracting Office who, in turn, notifies the contractor that the cited Criteria

requirements have been met. In the event of significant problems in reaching validation or acceptance of a contractor's systems, or in reaching agreement between DOE and contractor personnel on any Criteria matters, the Project Manager requests the Controller, through the cognizant Program Office, to arbitrate such matters. Subsequently, the Project Manager conducts periodic system surveillance to ensure continuing performance in accordance with the contractual requirements. Schedules developed for the conduct of surveillance reviews should be coordinated with the Controller.

5. Director, Procurement and Contracts Management. The Director, Procurement and Contracts Management develops and provides procurement regulations or implementing clauses for use in solicitation documents (e.g., Requests for Proposals, Program Opportunity Notices) and in contracts, and provides assistance in solving contractual implementation problems. The Director also supports contractors' systems reviews and surveillance activities and designates a focal point for coordination of Criteria matters with the Controller.

6. General Counsel. The General Counsel reviews, as appropriate, procurement solicitation and contract clauses to be used in applying the Criteria requirements and, when requested, provides assistance in resolving Criteria implementation problems.

7. Director of Administration. The Director of Administration develops and/or arranges training programs in the following areas: applying the Criteria contractually; reviewing contractor Criteria implementation; analyzing the contractors' cost and schedule performance reports; and conducting systems surveillance.

8. Inspector General. The Inspector General inspects the contractor systems review process, the conduct of system surveillance activities, or the operation of reviewed systems, when requested, for compliance with DOE policy

and provides the inspection results to the responsible Project Office, Program Office, and the Controller.

9. The Controller. As the DOE focal point for the Criteria and their interpretation, application, and interagency coordination, the Controller has major responsibilities to perform, including: defining the DOE Cost and Schedule Control Systems Criteria; developing the DOE policy for Criteria use and applications; developing guides, handbooks and other documentation to assist in Criteria implementation; resolving significant problems encountered during system reviews and surveillance; reviewing and approving Project Managers' recommendations for validation; and issuing formal DOE validation for contractors' management control systems.

- a. To maximize use of available resources, the Controller advises and assists participating DOE organizations in organizing and carrying out contractors' systems review activities, including the maintenance of an overall DOE schedule of such activities. To minimize the potential for conflicting and time-consuming interpretation of the Criteria, the Controller also provides Review Directors to assist in the reviews of contractors' Criteria implementations.
- b. To aid in consistent and expeditious system reviews, the Controller maintains a listing of qualified DOE personnel (including Controller construction management personnel) to serve on Review Teams, and coordinates their availability as requested. To accelerate and broaden DOE experience, the Controller, in coordination with Program Offices and Field Offices, arranges for DOE personnel to participate in systems reviews conducted by other government agencies.
- c. Additionally, the Controller maintains records of Criteria implementations by DOE contractors, exchanges such status information with other government agencies, and provides this information to the other DOE focal points for use in source selection.

10. Other Participants. The implementation of the Criteria also involves two other specialized functions. These functions are performed by the Cognizant Contracting Officer and Cognizant Auditor. Their responsibilities are discussed below:

- a. The Cognizant Contracting Officer represents the Contracting Office responsible for administering the contractual activities under the contract on which the Criteria are being or have been implemented. The contract administration function may be located at a Field Operations Office, Project Office, Site Office or Headquarters, depending on the project. The Cognizant Contracting Officer supports Criteria implementation and subsequent systems surveillance, as appropriate.
- b. The Cognizant Auditor represents the audit organization (DOE Field Operations Office, Defense Contract Audit Agency, etc.) responsible for auditing the DOE contract on which the Criteria are being or are implemented. The Cognizant Auditor is responsible for conducting audits of the contractor's accounting system policies and procedures for compliance with the Criteria. The Cognizant Auditor participates in Criteria implementation, as well as subsequent systems surveillance.

C. REVIEW TEAMS

Evaluation of a contractor's systems is conducted through a team approach. The Project Manager, in coordination with the Controller, will organize a team of qualified individuals to conduct the in-plant review of the contractor's management control systems. The purpose of these reviews is to verify that the contractor is operating systems which meet the contractual Criteria requirements.

1. Team Composition. The review team is composed of appropriate representatives from the Project Office, Controller, Field Office, Cognizant Contracting Officer, Cognizant Auditor, and cognizant Program Office, with each

member assigned specific review responsibility. The Controller identifies the Review Director and informs the other DOE focal points regarding the appointment, requesting these focal points to identify candidate team members. Team size and types of expertise of members will be determined by the review requirements; for example, full or modified implementation, contract value, contractor characteristics, Project Office composition, etc. As soon as a review schedule is developed, the Controller notifies all participants as far in advance as possible concerning the starting date and the planned duration of the review.

- a. The Review Director, appointed by the Controller in coordination with the Project Manager, serves as the technical advisor to the review team and is responsible for assuring that the review of the contractor's systems is consistent with DOE policy for Criteria use and application. Typical activities include assisting in overall review planning and review team selection, interpreting the DOE Criteria, policy and requirements, evaluating contractor earned value techniques, and consulting on review report preparation.
- b. The Team Chief, appointed by the Project Manager in coordination with the Controller, serves as the representative of the Project Manager for evaluation of a contractor's systems and is responsible for the review team's day-to-day activities. Typical activities include assisting in team member selection, planning and scheduling the review, organizing and leading the review team, resolving identified systems discrepancies with the contractor, and supervising the preparation of the review report.
- c. Review team members should be formally appointed and their designated review responsibilities stated in writing. Members will be full-time

participants during a review. The team may be augmented on a temporary basis with functional specialists to assist in review of specific areas. Normally, members should possess one or more of the following qualifications:

- o Prior Criteria implementation review experience;
- o Knowledge of the technical content of the project or contract;
- o Knowledge of the processes (e.g., design, manufacture, construction) that will be used to produce the contract end item;
- o Knowledge of the principal engineering design and test requirements of the activity under review;
- o General industrial engineering/production control background;
- o Accounting/auditing knowledge;
- o Project planning and control experience;
- o Management/cost/price analysis experience;
- o Contract negotiation or administration experience;
- o Configuration management experience; or
- o Systems engineering experience.

2. Team Operation. The team is responsible for the assessment of the contractor's compliance with the contractual Criteria requirements. Such assessment should include review of management control techniques used by the contractor's organizational elements which perform work on the contract. The team should not design or recommend changes to the contractor's systems in order to meet the Criteria. The contractor will be afforded an opportunity to correct the systems' deficiencies.

a. Team members are responsible to the Team Chief for the completion of their review assignments. To the extent possible, the Team Chief

assigns tasks consistent with background qualifications of team members. However, the Team Chief retains the prerogative to select and use any professional skills and methods considered necessary to adequately accomplish an assignment.

- b. The Team Chief makes all necessary arrangements to assure that team members are available for the required preliminary indoctrination and for each review for which the team member is needed. Members are administratively responsible to the Team Chief during the period of the review. In the event a follow-up review is necessary to determine the correction of observed deficiencies or to cover another phase of the project, the members of the original team should be reassembled, if practicable.

3. Training. All team members should receive training dealing with management control systems concepts and performance requirements and interpretations prior to participation in a review. Such training may be provided by DOE workshops, for example, and may be supplemented by additional instruction to ensure the fullest understanding of the task to be performed during the Demonstration Review. On-the-job training will be provided, when feasible, to enlarge upon background experience and classroom training, for members without prior review participation.

CHAPTER IV - IMPLEMENTATION REVIEW PROCEDURES

A. INTRODUCTION

This chapter provides guidance to DOE representatives for conducting a review of the contractors' systems under either a full or modified Criteria implementation. Actions required for the systems review under full implementation are specified in paragraph B of this chapter; those required under modified implementation are delineated in paragraph C. This chapter may serve also as a reference for contractors in preparing their systems descriptions, so as to accommodate more effective assessment of their systems by DOE representatives. Additional guidance for systems reviews and continued surveillance of contractors' systems is contained in DOE/CR-0018, Systems Review/Surveillance Guide.

B. FULL IMPLEMENTATION

From the general guidance provided here, implementation procedures may be adopted to specific situations as they arise. Details concerning each full implementation will be developed by the DOE Project Manager in coordination with other participating DOE organizations. The implementation will be consistent with this guidance.

1. Preaward Action. After it is determined that the Criteria will be applied on a contract, the requirements will be included in the solicitation document. A sample clause for this purpose is contained in Attachment 3. In response to the solicitation, each prospective contractor's proposal should include a description of the management control systems planned to be used under contract in meeting the Criteria requirements. Contractors may propose to use the existing systems which in their judgement meet the Criteria.

a. The contractor's management control systems must be described in sufficient detail to determine compliance with the Criteria and subsequently permit adequate surveillance of the operating systems. Contractors must show clearly how their systems meet DOE

requirements. While the contractor's system description is not expected to follow the Criteria Checklist (Attachment 2), the contractor should correlate the description with the checklist items to insure adequate coverage. Applicable company policy documents and procedures should be referenced or attached to the description. A sample outline of a management control systems description is shown in Figure 9.

- b. Contractors proposing to use management control systems previously validated may satisfy the Criteria requirements in the solicitation document by citing in their proposal the Memorandum of Understanding or Certificate of Validation.
- c. Normally, for a new contract, the Criteria evaluation review is accomplished as a part of precontract award procedures. This review consists of evaluating proposed or existing systems and methods by which prospective contractors plan to comply with the Criteria requirements. The review is basically an analysis of the contractors' management control systems descriptions submitted in response to the solicitation. If any part of a systems description cannot be clearly understood, clarification may be obtained from the contractor through the Source Evaluation Board. Care should be exercised to avoid improper disclosure of information obtained from contractors, especially in competitive situations. Following the evaluation review, a written report will be prepared by the evaluation review team which will attest whether or not the contractor's systems as described in the proposal comply with the contractual Criteria requirements. If not, the report will identify

A. GENERAL

Company Policy for Cost and Schedule Control
Administration of Policy
Systems Summary

B. ORGANIZATION

CWBS Development and Control
Organizational Structure & Responsibility
Integration of CWBS with Organizational Structure
Systems Integration
Subcontract Management

C. PLANNING & BUDGETING

Work Authorization
Schedule Development & Control
Cost Account/Work Package Development & Planning
Establishment of Performance Measurement Baseline
Overhead Planning & Budgeting
Management Reserve Budget Control
Undistributed Budget Control

D. ACCOUNTING

Procedures
Elements of Cost
Materials Cost Control
Purchase Order System
Recurring/Nonrecurring Costs
Overhead Procedures and Control
Data Base Description
Data Reconciliation

E. ANALYSIS

Earned Value Methods Determination & Use
Comparison of Actual versus Planned Performance
Variance Analysis
Estimate at Completion Derivation

F. REVISIONS & ACCESS TO DATA

Baseline Maintenance
Change Incorporation
Internal Replanning
Formal Reprogramming
Internal & External Reporting Procedures
Systems Surveillance
Access to Data

FIGURE 9 EXAMPLE OUTLINE MANAGEMENT CONTROL SYSTEMS DESCRIPTION

specific deficiencies. The report will be provided to the Source Evaluation Board.

2. Contract Award. The contract will require that the contractor's systems comply with the Criteria requirements throughout performance of the contract. The sample contract clause contained in Attachment 4 covers the requirements of the Criteria and other conditions.

a. The clause requires the contractor to establish, document, demonstrate, and use management control systems in accordance with the cited Criteria. It requires the contractor to obtain approval of changes to validated management control systems prior to their implementation and provides for government access to pertinent records and data associated with the management control systems.

b. When the Criteria are to be applied to selected subcontracts, this requirement will be mutually agreed to by the DOE Project Manager and the prime contractor. This decision should be based on the criticality of the subcontract to the project and should consider the dollar value of the subcontract involved. After agreement, the prime contractor will contractually require subcontractors to comply with the cited Criteria and incorporate adequate provisions for systems review and surveillance. Subcontracts selected for application of the Criteria should be identified in the prime contract. After a prime contractor has reviewed and accepted a subcontractor's management control systems, the prime contractor should provide the subcontractor with a written statement documenting the acceptance. Review and validation or acceptance and surveillance of a subcontractor's management con-

trol systems may be performed by DOE in coordination with the prime contractor when requested by either the prime contractor or subcontractor. DOE will follow the same procedures in conducting subcontractor reviews that are used during prime contractor reviews.

- c. Contractors whose management control systems were validated under another DOE or government contract of the same type at the same location will not be required to undergo a Demonstration Review on a new contract except under the following conditions: significant modifications have been made to the previously validated systems, or surveillance reveals that the systems have not been operated as contractually agreed to in the prior contract, or DOE has determined that the validated systems are no longer operational. Prior validation can be withdrawn if the systems are not operated as validated.
- d. When a contractor has a previously validated system, a new contract at the same location may require that a Subsequent Application Review be conducted. This requirement will be determined jointly by the Project Manager and Controller. This review is normally conducted within 90 days after contract award to determine that the contractor has properly applied the validated management control systems to the new contract and the Criteria requirements are being met. The team composition and duration for the Subsequent Application Review should be minimized.

- 3. Post-award Actions. After contract award, the Review Director and Team Chief should determine in conjunction with the contractor, an appropriate date for the initial review team visit. This visit's purpose is to review the contractor's

plans for implementing the Criteria. Succeeding visits are to assess the contractor's progress and to conduct the detailed Demonstration Review of the contractor's management control systems in operation. These visits to the contractor's facility are described below.

- a. Implementation Visit. As soon as possible after contract award, preferably within 30 days, the review team should visit the contractor's plant and review the contractor's plans for Criteria implementation. This visit provides an early dialogue between DOE and the contractor relative to the review process. The contractor should make presentations to reflect systems design and operation and explain applicable reports. The team will examine selected documents and procedures proposed by the contractor. Areas of noncompliance or potential problems will be identified to the contractor. During this visit, a schedule will be developed for the Readiness Assessment and Demonstration Review.
- b. Readiness Assessment. The Readiness Assessment is usually three to five days in duration and precedes the Demonstration Review. Without involving the time and expense of the full DOE team and contractor personnel, it provides an opportunity to review progress toward implementing the Criteria requirements, to clear up misunderstandings, and to assess the contractor's readiness to demonstrate fully integrated and compliant management control systems. It assists in preparation for the Demonstration Review by familiarizing key team members with the fundamentals of the contractor's systems. Any discrepancies revealed should be identified to the contractor for correction.

c. Demonstration Review. The Demonstration Review will commence as soon as practicable following the contractor's systems implementation and correction of deficiencies, if any, identified during the Readiness Assessment.

- (1) The review team will examine the contractor's working papers and documents to ascertain compliance and document its findings. For this purpose, the contractor will make available to the team the documents used for organizing, planning, scheduling, budgeting, authorizing, accounting, controlling and estimating the work and any other procedural or functional documents which apply to the contract. The documentation must be complete, current, and accurate.
- (2) The contractor will demonstrate to the team how the management control systems are structured and used in actual operation. All appropriate internal planning and control documentation required for an in-depth analysis of the adequacy of the systems in relation to the Criteria requirements and the work under contract will be made available.
- (3) The contractor should have a current systems description available which describes the management control systems. Applicable portions of the systems description and operating procedures should be available at the contractor's operating levels. Detailed operating procedures should delineate responsibilities of operating personnel, limitations on action, and internal authorizations required.

(4) The burden of proof for demonstrating compliance with the Criteria requirements necessarily rests with the contractor. The review team will assess compliance with these requirements. If the contractor's systems are not acceptable, areas to be reexamined will be clearly identified, and corrective actions to achieve compliance must be initiated by the contractor. A schedule for developing and implementing solutions and, consequently, for determining acceptability will be agreed upon by the contractor and Review Director.

4. Review Process. The team will follow the Criteria Checklist (Attachment 2) to assure that an orderly, comprehensive, penetrating and conclusive review is conducted. The checklist includes the Criteria, followed by specific questions, to assist in interpreting the contractor's compliance with each of the Criteria.

a. The team may employ sampling techniques when it is not practical to review entire systems. Generally, the team will proceed in any given area until conclusive findings are reached. If necessary, the Team Chief will identify the cutoff point in a particular area.

b. The responsibility for assuring that a contractor's indirect cost control system is in compliance with the Criteria is normally assigned to the Cognizant Auditor representative on the Demonstration Review team. If a recent evaluation of the indirect cost control system substantiates compliance with the Criteria, a second investigation during the Demonstration Review will not be required.

5. **Review Report.** At the conclusion of the Demonstration Review, a formal report will be prepared and submitted to the Review Director. Preparation of the Demonstration Review Report is the responsibility of the Team Chief. The report will state whether the contractor's systems comply with the contractual Criteria requirements and if the team recommends the contractor's systems for validation. If they do not comply, the report will identify the areas of non-compliance in detail and the contractor's plan for corrective action. Any significant disagreements on the final wording or content of the report will be resolved by the Review Director. DOE/CR-0018, Systems Review/Surveillance Guide, discusses in greater detail the format, preparation, and content of the Demonstration Review Report.

6. **Systems Validation.** The Demonstration Review Report will be the basis for validation of the contractor's management control systems by the DOE Controller. After the contractor's correction of any deficiencies, the Review Director will forward the Demonstration Review Report to the Project Manager. After reviewing the report and concurring in the team's recommendation, the Project Manager, in turn, will recommend systems validation to the DOE Controller through the cognizant Program Office. After Controller approval, the Controller will issue a Certificate of Validation to the contractor documenting that the contractor's systems comply with the Criteria.

- a. The Cognizant Contracting Officer will officially notify the contractor that the contractor's systems have complied with the Criteria requirements in the contract and provide the contractor with copies of the Demonstration Review Report. Once a contractor is validated, the demonstration of system operation upon award

of a new contract with the Criteria requirements is normally not required.

b. The DOE Controller will control the issuance and distribution of Demonstration Review Reports within DOE. When applicable, the cover page of each report will contain a statement indicating that the report contains contractor proprietary data, and that distribution of copies will be restricted. Contents, in whole or in part, will not be disseminated outside DOE without the express permission of the Controller and the contractor.

7. Maintaining Compliance. The validated management control systems description will be referenced in the contract by title and date. Validation of the contractor's management control systems is not intended to inhibit innovations and improvement of the systems. However, the contractors are obligated contractually to maintain their systems in the validated state. Surveillance to assure that contractors maintain compliance will be accomplished by the DOE Project Office and as agreed to with the Cognizant Contracting Officer and Cognizant Auditor. Indications that a contractor's systems are failing to operate as validated can be cause for scheduling another review and may result in revocation of validation. Specific discrepancies discovered as a result of surveillance should be corrected immediately. Contractor proposed changes to validated management control systems will be submitted to the Cognizant Contracting Officer for approval prior to incorporation.

8. Memorandum of Understanding. After validation of a contractor's management control systems, the contractor's systems description should be updated as necessary to assure that the validated systems are described accurately.

Since a complete systems description may be voluminous, consideration should be given to preparing it in a format which may be referenced or summarized for use in related documents. A contractor desiring a Memorandum of Understanding, subsequent to systems validation under a current or previous DOE contract, will direct a written request to the Cognizant Contracting Officer. A Memorandum of Understanding (referencing the validated systems description) may then be executed relative to the application of the systems to other contracts with Criteria requirements. A copy of the Memorandum of Understanding will be forwarded to the Controller for approval. An example of a Memorandum of Understanding is provided in Attachment 5. Pertinent features are described below.

- a. The Memorandum of Understanding is not a contract clause. It will be incorporated by appropriate reference in any contract requiring compliance with the Criteria. This document serves to clarify the intent of the contractor and DOE relative to implementation of the Criteria. It contains reference to description of the validated systems and provides for access to pertinent contractor records and data for surveillance purposes. Provision is also made to permit changes to validated systems.
- b. When a Memorandum of Understanding is to be consummated between DOE and the contractor, it will be prepared and executed by the appropriate Cognizant Contracting Officer. A Memorandum of Understanding normally will be limited for application to a single contractor division, facility or location as defined for the purpose of contract administration.
- c. A contractor may respond to solicitations for potential contracts by citing the Memorandum of Understanding in proposals. DOE may

conduct a Subsequent Application Review to evaluate the current status of the validated systems to ascertain whether the systems are acceptable without requiring a Demonstration Review. Reviews may be conducted using any contract at the location where the Criteria are applied, provided that the contract selected will ensure a representative appraisal of the contractor's systems in operation. The use of an alternative contract for review purposes will be approved by the Controller.

C. MODIFIED IMPLEMENTATION

1. **Preadward Activities.** When the Criteria are to be implemented on a modified basis, the requirement is detailed in the solicitation document and contract similar to full Criteria implementation. The sample clauses contained in Attachments 3 and 4 can be tailored to state the modified requirements. Any Criteria not deemed applicable should be specified as exemptions in the clause. Proposal evaluation and subcontract application follows the procedures described for full Criteria implementation in Paragraph IV.B.

- a. The degree of technical risk, contract value, and potential for cost growth are typical of the factors to be considered in determining the degree of Criteria implementation required for effective project management. Additionally, the Project Manager should assure that the proposed cost and schedule performance reporting requirements will meet project management needs. The Project Manager is encouraged to request advice and assistance in these matters from the Controller.
- b. For new contracts, each offeror will submit a description of the management control systems proposed for use in conducting the work. If an offeror is using management control systems that have been

previously validated for a full Criteria implementation or accepted for a modified Criteria implementation, this should be cited in the proposal. For existing contracts, modified Criteria implementation occurs by contractual agreement between the Cognizant Contracting Officer and the participating contractor.

2. Post Contract Award Activities. After contract award, the scope of review activities under modified Criteria implementation will vary depending upon contract value and content. For example, a contract in the \$30 to \$50 million range will normally receive more management attention than a contract for \$2 million. Similarly, a high technical risk contract will demand more attention than one with minimal risk. Thus, exact guidelines cannot be given. However, for the Project Manager to make effective use of contractor reports, the operation of the contractor's systems generating the reports should be clearly understood and should be operating in accordance with the stated Criteria requirements. In order to accomplish this objective, an Acceptance Review visit should be made to the contractor's facility soon after receipt of initial performance reports to observe the contractor's systems in operation and determine if the specified Criteria requirements have been met.

a. Prior to the visit, the DOE Project Manager should perform the following:

- o Request the contractor to brief the DOE representatives on the systems operation, how they meet the cited Criteria requirements, and how reports to DOE are prepared;
- o Identify any potential problem areas in the contractor's systems from review of the systems description and discuss necessary corrective actions with the contractor;

- o Coordinate a date for the Acceptance Review visit with the contractor;
- o Identify appropriate DOE representatives who should participate in the review;
- o Familiarize the representatives with the specified Criteria requirements and the techniques the contractor proposes to use for compliance with the requirements; and
- o Advise the DOE Controller of planned activities and request assistance, if needed.

b. During the Acceptance Review visit, the DOE Project Manager and the DOE representatives should:

- o Verify that the contractor's systems and procedures function in accordance with the systems description and contract provisions and provide reports that accurately reflect contract task progress;
- o Review internal contractor management control reports that support external reporting;
- o Identify and discuss with the contractor any aspects of the operating systems that may differ from the systems description and contract requirements, and agree on corrective action to be taken; and
- o Agree on how contractor proposed changes to the management control systems will be processed.

c. After the visit, the DOE Project Manager should:

- o Document systems operation by Criteria category and agreements on corrective actions to be taken by the contractor;

- o Arrange for surveillance requirements and monitor contractor corrective actions;
- o Notify the Controller through the cognizant Program Office of the acceptance of the contractor's systems for successfully implementing the modified Criteria for the specific project; and
- o Inform the Cognizant Contracting Officer to notify the contractor that the modified Criteria implementation requirements have been satisfied.

D. SYSTEMS SURVEILLANCE

1. Requirements. Contractors are required to operate their management control systems as validated or accepted by DOE. It is the DOE Project Manager's responsibility to ensure the contractor's continued compliance with the specified Criteria requirements, throughout the contract's duration. This is accomplished by agreement with on-site personnel (e.g., representatives of the Cognizant Contracting Officer and Cognizant Auditor) or through periodic visits to the contractor by Project Office representatives. Contractors should be encouraged to establish plans for their own and appropriate subcontractor surveillance. Generally, such contractor activity can be made a part of existing audit procedures. Additional guidance for performing the surveillance function is contained in DOE/CR-0018 , Systems Review/Surveillance Guide.

2. Surveillance Phases. Normally, the surveillance function is accomplished in two phases. The first phase begins after contract award. At this time the contractor's management control systems may be in a stage of implementation in which they do not fully satisfy the Criteria requirements, indicating a need for modification and improvement. The second phase begins after systems review and the contractor's operational systems have been validated or accepted.

- a. Phase I surveillance is directed to assure satisfactory implementation of the contractor's management control systems by monitoring the contractor's progress toward such implementation. During this period, even though the contractor's systems have not yet been validated or accepted, it is necessary that DOE make decisions based upon contractor reports derived from the operating management control systems. Thus, it is necessary to determine if the data in the reports are valid and complete.
- b. Phase II surveillance follows validation or acceptance of the contractor's management control systems and is more formalized. The surveillance should provide for verifying, tracing, and evaluating the information contained in the reports submitted to DOE. It also should ensure that the contractor's management control systems continue to operate as required by the contract and that any proposed or actual changes are reviewed or approved, as applicable. If, during surveillance, the contractor's practices are found to differ from the systems validated or accepted, the contractor will take the necessary action to rectify the situation.

ATTACHMENT 1

GLOSSARY OF TERMS

ACTUAL COST OF WORK PERFORMED (ACWP). The costs actually incurred and applied or distributed in accomplishing the work performed within a given time period.

ACTUAL DIRECT COSTS. Those costs identified specifically with a contract, based upon the contractor's cost identification and accumulation system as accepted by DOE (See Direct Costs).

APPLIED DIRECT COSTS. The amounts charged to work in process in the time period associated with the consumption of labor, material, and other direct resources, without regard to the date of commitment or the date of payment.

APPORTIONED EFFORT. Effort (e.g., quality assurance) that by itself is not readily divisible into work packages but which is related in direct proportion to a specific measured effort.

AT COMPLETION VARIANCE. The difference between the Budget at Completion (BAC) and Estimate at Completion (EAC). At any point in time, it represents a forecast of budget overrun or underrun.

AUTHORIZED WORK. That effort which has been definitized and is on contract with DOE plus that for which definitized contract costs have not been agreed to but for which written authorization has been received by the contractor.

BUDGET AT COMPLETION (BAC). The sum of all budgets allocated to the contract. It consists of the performance measurement baseline and all management reserve budget. Total allocated budget and BAC are synonymous.

BUDGETED COST FOR WORK PERFORMED (BCWP). The sum of the budgets for completed work packages and completed portions of open work packages, plus the appropriate portion of the budgets for level of effort and apportioned effort.

BUDGETED COST FOR WORK SCHEDULED (BCWS). The sum of the budgets for work packages, planning packages, etc. scheduled to be accomplished (including in-process work packages), plus the level of effort and apportioned effort budgeted for the relevant time period.

COGNIZANT AUDITOR. Represents the cognizant government audit organization responsible for auditing the DOE contract on which the Criteria are being or are implemented. Reviews the contractor's accounting system policies and procedures for compliance with the Criteria.

COGNIZANT CONTRACTING OFFICER. The DOE Contracting Officer, within the cognizant contracting office, responsible for administering the contract on which the Criteria are being implemented.

CONTRACT BUDGET BASE. The negotiated contract cost plus the estimated cost of authorized unpriced work. In the absence of a negotiated value, it is the cost normally recognized by both DOE and the contractor as the value to be used for contract performance measurement purposes.

CONTRACT WORK BREAKDOWN STRUCTURE (CWBS). See Work Breakdown Structure.

CONTRACTOR. An entity in the private sector which enters into contracts with the government. In this guide, the word also applies to government-owned, contractor-operated activities which perform work for DOE.

COST AND SCHEDULE CONTROL SYSTEMS CRITERIA. DOE-established characteristics that a contractor's internal management control systems must possess to assure effective planning and control of contract work, costs, and schedules.

COST ACCOUNT. A management control point at which actual costs are accumulated and performance determined. A cost account is a natural control point for cost and schedule planning and control since it represents the work assigned to one responsible organizational element on one CWBS element.

COST VARIANCE. The difference between BCWP and ACWP. At any point in time it shows whether the work actually performed has cost more or less than that budgeted.

CRITERIA. See Cost and Schedule Control Systems Criteria.

CRITERIA CHECKLIST. A list of questions compiled by the Controller used to assist in interpreting a specific Criterion. The checklist provides the basis for Criteria use from evaluation of proposals describing a contractor's systems to on-site review of the contractor's operating systems.

DEFENSE CONTRACT AUDIT AGENCY. A Department of Defense agency that provides, on request, accounting and financial services to DOE contracting offices responsible for procurement and contract administration.

DIRECT COSTS. Any costs which are identified specifically with a particular final cost objective. Direct costs are not limited to items which are incorporated in the end product.

EARNED VALUE. The periodic, consistent, and objective measurement of work performed in terms of the budget planned for that work. In Criteria terminology, Earned Value is the Budgeted Cost of Work Performed. It is compared to the Budgeted Cost of Work Scheduled (planned) to obtain schedule performance and it is compared to the Actual Cost of Work Performed to obtain cost performance.

ESTIMATE AT COMPLETION (EAC). Direct costs, plus indirect costs allocated to the contract to date, plus the estimate of costs (direct and indirect) for authorized work remaining.

ESTIMATE TO COMPLETE. The time-phased estimate of costs (direct and indirect) for authorized work remaining.

FOCAL POINT. The principal point of contact, in a particular DOE organization, responsible for coordination and exchange of information related to CSCSC application, implementation, or surveillance.

FULL CRITERIA IMPLEMENTATION. The application of the Criteria to designated contracts. DOE formally reviews the contractor implementation and issues a Certificate of Validation for successful contractor compliance.

GENERAL AND ADMINISTRATIVE (G&A). A form of indirect expenses incurred in the direction, control, and administration of contractor operations.

INDIRECT COSTS. Costs which, because of their incurrence for common or joint objectives, are not readily subject to treatment as direct costs.

INTERNAL REPLANNING. Replanning actions performed by the contractor within the recognized total allocated budget.

LEVEL OF EFFORT (LOE). Support type effort (e.g., vendor liaison) that does not readily lend itself to measurement of discrete accomplishment. It is generally characterized by a uniform rate of activity over a specific period of time.

MAJOR SYSTEM ACQUISITION PROJECTS. Those projects that: are directed at and are critical to fulfilling a DOE mission; entail the allocation of relatively large resources; and warrant special management attention.

MANAGEMENT CONTROL SYSTEMS. The systems (e.g., planning, scheduling, budgeting, estimating, work authorization, cost accumulation, performance measurement, etc.) used by a contractor to plan and to control the cost and scheduling of work.

MANAGEMENT RESERVE BUDGET. The portion of the contract's total allocated budget withheld for contractor management control purposes rather than designated for the accomplishment of a specific task or set of tasks. It is not a part of the performance measurement baseline.

MEMORANDUM OF UNDERSTANDING. An agreement between a contractor and DOE indicating the contractor's intention to use validated management control systems on future contracts which require compliance with the Criteria.

MODIFIED CRITERIA IMPLEMENTATION. The application of the Criteria, with less rigorous requirements for the verification and substantiation of the operation of the contractor's management control systems, including organizational and work breakdown structures, their definition, and levels of integration and utilization. DOE conducts sufficient system review to assure contractor implementation is in compliance with the contractual requirements.

NEGOTIATED CONTRACT COST. The estimated cost negotiated in a cost-reimbursement type contract or the negotiated contract target cost in either a fixed-price-incentive contract or a cost-plus-incentive-fee contract.

ORIGINAL BUDGET. The budget established at, or near, the time the contract was signed, consistent with the negotiated contract cost.

OVERHEAD. See Indirect Costs.

PERFORMANCE MEASUREMENT BASELINE. The time-phased budget plan against which contract performance is measured. It is formed by the budgets assigned to scheduled cost accounts and the applicable indirect budgets. For future effort, not planned to the cost account level, the performance measurement baseline also includes budgets assigned to higher level organizations and CWBS elements and undistributed budget. It will reconcile to the contract budget base. It equals the BAC less the management reserve budget.

PERFORMING ORGANIZATION. A defined unit within the contractor's organizational structure which actually performs the work.

PLANNING PACKAGE. A logical aggregation of work within a cost account, normally the far term effort that can be identified and budgeted in early baseline planning, but which will be further defined into work packages, LOE, or apportioned effort.

PROJECT. A major endeavor within a program with: firmly scheduled beginning, intermediate and ending date milestones; prescribed performance requirements; prescribed costs; and close management planning and control. A project is not constrained to any specific element of the budget structure, e.g., operating or construction.

PROJECT MANAGER. The individual who is assigned the responsibility and is delegated the full-line authority for the management of a specific DOE project.

PROJECT SUMMARY WBS (PSWBS). See Work Breakdown Structure.

REPROGRAMMING. A comprehensive replanning of the effort remaining in the contract resulting in a revised total allocated budget which exceeds the contract budget base.

RESPONSIBLE ORGANIZATIONAL ELEMENT. A defined unit or individual within the contractor's organizational structure assigned responsibility for accomplishing specific tasks.

REVIEW DIRECTOR. The review team member appointed by the Controller in coordination with the Project Manager. The Review Director serves as the technical advisor to a review team and is responsible for assuring that the review of the contractor's systems is consistent with DOE policy for Criteria use and application. Typical activities include assisting in overall review planning and review team selection, interpreting the DOE Criteria, policy and requirements, evaluating contractor earned value techniques, and consulting on review report preparation.

REVIEW TEAM. Evaluation of a contractor's systems for compliance with the Criteria is conducted through a team approach. The team is composed of appropriate representatives from the Project Office, Controller, etc., with each member assigned specific review responsibilities.

SCHEDULE VARIANCE. The difference between BCWP and BCWS. At any point in time it represents the difference between the dollar value of work actually performed (accomplished) and that scheduled to be accomplished.

SIGNIFICANT VARIANCES. Those differences between planned and actual performance which exceed established thresholds and which require further review, analysis, and action.

SYSTEMS. See Management Control Systems.

TEAM CHIEF. The review team member appointed by the Project Manager in coordination with the Controller. The Team Chief serves as the representative of the Project Manager for evaluation of a contractor's systems and is responsible for the review team's day-to-day activities. Typical activities include planning and scheduling the review, organizing and leading the review team, resolving identified systems discrepancies with the contractor, and preparing the review report.

UNDISTRIBUTED BUDGET. The budget within the performance measurement baseline which is not identified to both a responsible organization and a CWBS element.

VALIDATION. The Controller notification to the contractor that the contractor has satisfactorily demonstrated full Criteria implementation. The Controller issues a Certificate of Validation to the contractor documenting that the contractor's systems comply with the Criteria and adds the contractor to the DOE listing of validated contractors. Once a contractor is validated, the demonstration of systems operation upon award of a new contract of the same type and at the same location (with the Criteria requirement) is normally not required. The Contracting Officer will officially notify the contractor that the contractor's systems have been accepted as being in compliance with the Criteria provisions set forth in the contract.

WORK BREAKDOWN STRUCTURE (WBS). A product-oriented family tree division of hardware, software, facilities, and other items which organizes, defines, and displays all of the work to be performed in accomplishing the project objectives.

- o Project Summary Work Breakdown Structure (PSWBS). A summary WBS tailored by project management to the specific project with the addition of the elements unique to the project. Generally, the PSWBS will identify project elements through the third level.
- o Contract Work Breakdown Structure (CWBS). The complete WBS for a contract developed and used by a contractor in accordance with the contract work statement. It extends the PSWBS to the lowest level appropriate to the definition of the contract work.

WORK PACKAGES. Detailed jobs, or material items, identified by the contractor for accomplishing work required to complete the contract. A work package has the following characteristics:

- o It represents units of work at levels where work is performed;
- o It is clearly distinguished from all other work packages;
- o It is assignable to a single organizational element and cost account;
- o It has scheduled start and completion dates and interim milestones,

as applicable, all of which are representative of physical accomplishment;

- o It has a budget or assigned value expressed in terms of dollars, manhours or other measurable units;
- o Its duration is limited to a relatively short time span or it is subdivided by discrete milestones to facilitate the objective measurement of work performed; and
- o Its duration can be integrated with higher level schedules.

CRITERIA CHECKLIST

I. ORGANIZATION

1. DEFINE ALL THE AUTHORIZED WORK AND RELATED RESOURCES TO MEET THE REQUIREMENTS OF THE CONTRACT, USING THE FRAMEWORK OF THE CONTRACT WORK BREAKDOWN STRUCTURE (CWBS).
 - a. Is only one CWBS used for the contract?
 - b. Is all contract work included in the CWBS?
 - c. Are the following elements included in the CWBS:
 - (1) Products or services to be provided?
 - (2) CWBS elements specified for external reporting?
 - (3) Appropriate intermediate levels?
 - (4) Cost account levels?
2. IDENTIFY THE INTERNAL ORGANIZATIONAL ELEMENTS AND THE MAJOR SUBCONTRACTORS RESPONSIBLE FOR ACCOMPLISHING THE AUTHORIZED WORK.
 - a. Are all authorized tasks assigned to identified organizational elements (this must occur at the cost account level as a minimum)?
 - b. Is subcontracted work defined and identified to the appropriate subcontractor within the proper CWBS element?
3. PROVIDE FOR THE INTEGRATION OF THE CONTRACTOR'S PLANNING, SCHEDULING, BUDGETING, ESTIMATING, WORK AUTHORIZATION, AND COST ACCUMULATION SYSTEMS WITH EACH OTHER, THE CWBS AND THE ORGANIZATIONAL STRUCTURE.
 - a. Are the contractor's management control systems listed above integrated with each other, the CWBS and the organizational structure at the total contract and cost account levels?
4. IDENTIFY THE MANAGERIAL POSITIONS RESPONSIBLE FOR CONTROLLING OVERHEAD (INDIRECT COSTS).
 - a. Are the following organizational elements and managers clearly identified:
 - (1) Those responsible for the establishment of budgets and assignment of resources for overhead?
 - (2) Those responsible for overhead performance and control of related costs?

b. Are the responsibilities and authorities of each of the above organizational elements or managers clearly defined?

5. PROVIDE FOR INTEGRATION OF THE CWBS WITH THE CONTRACTOR' FUNCTIONAL ORGANIZATIONAL STRUCTURE IN A MANNER THAT PERMITS COST AND SCHEDULE PERFORMANCE MEASUREMENT FOR CWBS AND ORGANIZATIONAL ELEMENTS.

a. Is each cost account assigned to a single organizational element directly responsible for the work and identifiable to a single element of the CWBS?

b. Are the data elements for measuring performance (BCWS, BCWP, ACWP, BAC, EAC, and associated variances) available at the levels selected for control and analysis?

II. PLANNING AND BUDGETING

1. SCHEDULE THE AUTHORIZED WORK IN A MANNER WHICH DESCRIBES THE SEQUENCE OF WORK AND IDENTIFIES THE SIGNIFICANT TASK INTER-DEPENDENCIES REQUIRED TO MEET THE DEVELOPMENT, PRODUCTION, CONSTRUCTION, INSTALLATION, AND DELIVERY REQUIREMENTS OF THE CONTRACT.

a. Does the scheduling system contain:

- (1) A contract master schedule?
- (2) Intermediate schedules as required which provide a logical sequence from the master schedule to the cost account level?
- (3) Detailed schedules which support cost account start and completion dates/ events?

b. Are significant decision points, constraints, and interfaces identified as key milestones?

c. Does the scheduling system provide for the identification of work progress against technical and other milestones, and also provide for forecasts of completion dates of scheduled work?

d. Are detail schedule dates formally recorded in terms of physical accomplishment by date?

2. IDENTIFY PHYSICAL PRODUCTS, MILESTONES, TECHNICAL PERFORMANCE GOALS, OR OTHER INDICATORS THAT WILL BE USED TO MEASURE OUTPUT.

a. Are meaningful indicators identified for use in measuring the status of cost and schedule performance?

b. Does the contractor's system identify and measure work accomplish-

ment against the schedule plan?

c. Are current work performance indicators and goals relatable to original goals as modified by contractual changes, replanning, and re-programming actions?

3. ESTABLISH AND MAINTAIN A TIME-PHASED BUDGET BASELINE AT THE COST ACCOUNT LEVEL AGAINST WHICH CONTRACT PERFORMANCE CAN BE MEASURED. INITIAL BUDGETS ESTABLISHED FOR THIS PURPOSE WILL BE BASED ON THE NEGOTIATED TARGET COST. ANY OTHER AMOUNT USED FOR PERFORMANCE MEASUREMENT PURPOSES MUST BE FORMALLY RECOGNIZED BY BOTH THE CONTRACTOR AND THE GOVERNMENT.

a. Does the performance measurement baseline consist of the following:

- (1) Time-phased cost account budgets?
- (2) Higher level budgets (budgets assigned to both a functional organization and CWBS element, but not yet broken down into cost account budgets)?
- (3) Undistributed budget, if any?
- (4) Indirect budgets, if not included in the above?

b. Is the entire contract planned in time-phased cost accounts to the extent practicable?

c. In the event that future contract effort cannot be defined in sufficient detail to allow the establishment of cost accounts, is the remaining budget assigned to the lowest practicable functional organization and CWBS level element for subsequent distribution to cost accounts?

d. Does the contractor require sufficient detailed planning of cost accounts to constrain the application of budget initially allocated for future effort to current effort?

e. Are cost accounts opened and closed based on the start and completion of work contained therein?

4. ESTABLISH BUDGETS FOR ALL AUTHORIZED WORK WITH SEPARATE IDENTIFICATION OF COST ELEMENTS (LABOR, MATERIAL, OTHER DIRECT COST).

a. Does the budgeting system contain:

- (1) The total budget for the contract (including estimates for authorized but unpriced work)?
- (2) Budgets assigned to major functional organizations?
- (3) Budgets assigned to cost accounts?

b. Are the budgets assigned to cost accounts planned and identified in terms of the following cost elements:

- (1) Direct labor dollars and/or hours?
- (2) Material and/or subcontract dollars?
- (3) Other direct dollars?

c. Does the work authorization system contain:

- (1) Authorization to proceed with all authorized work or to terminate it, as applicable?
- (2) Appropriate work authorization documents which subdivide the contractual effort and responsibilities within functional organizations?

5. TO THE EXTENT THE AUTHORIZED WORK CAN BE IDENTIFIED IN WORK PACKAGES, ESTABLISH BUDGETS FOR THIS WORK IN TERMS OF DOLLARS, HOURS, OR OTHER MEASURABLE UNITS. WHERE THE ENTIRE COST ACCOUNT CANNOT BE SUBDIVIDED INTO DETAILED WORK PACKAGES, IDENTIFY THE FAR TERM EFFORT IN LARGER PLANNING PACKAGES FOR BUDGET AND SCHEDULING PURPOSES.

- a. Do work packages reflect the actual way in which the work will be done and are they meaningful product or task oriented subdivisions of a higher level element of work?
- b. Are detailed work packages planned as far in advance as practicable?
- c. Is work progressively subdivided into detailed work packages as requirements are defined?
- d. Is future work which cannot be planned in detail subdivided to the extent practicable for budgeting and schedule purposes?
- e. Are work packages reasonably short in time duration or do they have adequate objective indicators/milestones to minimize the in-process work evaluation?
- f. Do work packages consist of discrete tasks which are adequately described?
- g. Can the contractor substantiate work package and planning package budgets?
- h. Are budgets or value assigned to work packages and planning packages in terms of dollars, hours, or other measurable units?
- i. Are work packages assigned to performing organizations?

6. PROVIDE THAT THE SUM OF ALL WORK PACKAGE BUDGETS PLUS PLANNING PACKAGE BUDGETS WITHIN A COST ACCOUNT EQUALS THE COST ACCOUNT BUDGET

a. Does the sum of all work package budgets plus planning package budgets within cost accounts equal the budgets assigned to those cost accounts?

7. IDENTIFY RELATIONSHIPS OF BUDGETS OR STANDARDS IN UNDERLYING WORK AUTHORIZATION SYSTEMS TO BUDGETS FOR WORK PACKAGES.

a. Where engineered standards or other internal work measurement systems are used, is there a formal relationship between these values and cost account or work package budgets?

8. IDENTIFY AND CONTROL LEVEL OF EFFORT (LOE) ACTIVITY BY TIME-PHASED BUDGETS ESTABLISHED FOR THIS PURPOSE. ONLY THAT EFFORT WHICH CANNOT BE IDENTIFIED AS WORK PACKAGES OR AS APPORTIONED EFFORT WILL BE CLASSIFIED AS LOE.

a. Are time-phased budgets established for planning and control of level of effort activity by category of resource, for example, type of manpower and/or material?

b. Is work properly classified as measured effort, LOE, or apportioned effort and appropriately separated?

9. ESTABLISH OVERHEAD BUDGETS FOR THE TOTAL COSTS OF EACH SIGNIFICANT ORGANIZATIONAL COMPONENT WHOSE EXPENSES WILL BECOME INDIRECT COSTS. REFLECT IN THE CONTRACT BUDGETS AT THE APPROPRIATE LEVEL, THE AMOUNTS IN OVERHEAD POOLS THAT WILL BE ALLOCATED TO THE CONTRACT AS INDIRECT COSTS.

a. Are overhead budgets established on a facility-wide basis at least annually for the life of the contract?

b. Are overhead budgets established for each organization which has authority to incur overhead costs?

c. Are all elements of expense identified to overhead budgets?

d. Are overhead budgets and costs (e.g. engineering overhead, IR&D) being handled in accordance with the disclosure statement when applicable, or otherwise properly classified?

e. Is the anticipated (firm and potential) business base projected in a rational, consistent manner?

- f. Are overhead budgets established on a basis consistent with the anticipated direct business base?
- g. Are the requirements for all items of overhead established by rational, traceable processes?
- h. Are the overhead pools formally and adequately identified?
- i. Are the organizations and items of cost assigned to each pool identified?
- j. Are projected overhead costs in each pool and the associated direct costs used as the basis for establishing interim rates for allocating overhead to contracts?
- k. Are projected overhead rates applied to the contract beyond the current year based on:
 - (1) Contractor financial periods, e.g., annual?
 - (2) The projected business base for each period?
 - (3) Contemplated overhead expenditure for each period based on the best information currently available?
- l. Are overhead projections adjusted in a timely manner to reflect:
 - (1) Changes in the current direct and projected base?
 - (2) Changes in the nature of the overhead requirements?
 - (3) Changes in the overhead pool and/or organization structure?
- m. Are the CWBS and organizational levels for application of the projected overhead costs identified?

10. IDENTIFY MANAGEMENT RESERVE BUDGET AND UNDISTRIBUTED BUDGET.

- a. Is all management reserve budget identified and excluded from the performance measurement baseline?
- b. Are records maintained to show how management reserve budget is used?
- c. Is undistributed budget limited to contract effort which cannot yet be planned to cost accounts?
- d. Are records maintained to show how undistributed budget is controlled?

11. PROVIDE THAT THE CONTRACT BUDGET BASE IS RECONCILED WITH THE SUM OF ALL INTERNAL CONTRACT BUDGETS AND MANAGEMENT RESERVE BUDGET.

- a. Does the contractor's systems description or procedures require that

the performance measurement baseline plus management reserve budget equal the contract budget base?

b. Do the sum of the cost account budgets, higher level organizational and CWBS elements budgets, undistributed budget, and management reserve budget reconcile with the contract budget base?

III. ACCOUNTING

1. RECORD DIRECT COSTS ON AN APPLIED OR OTHER ACCEPTABLE BASIS IN A FORMAL SYSTEM THAT IS CONTROLLED BY THE GENERAL BOOKS OF ACCOUNT.

a. Does the accounting system provide a basis for auditing records of direct costs chargeable to the contract?

b. Are labor, material, and other direct cost accumulated within cost accounts in a manner consistent with their budgets using recognized, acceptable costing techniques and controlled by the general book of accounts?

2. SUMMARIZE DIRECT COSTS FROM COST ACCOUNTS INTO THE CWBS WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE CWBS ELEMENTS.

a. Is it possible to summarize direct costs from the cost account level through the CWBS to the total contract level without allocation of a lower level CWBS element to two or more higher level CWBS elements (this does not preclude the allocation of costs from a cost account containing common items to appropriate using cost accounts)?

3. SUMMARIZE DIRECT COSTS FROM THE COST ACCOUNT INTO THE CONTRACTOR'S FUNCTIONAL ORGANIZATIONAL ELEMENTS WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE ORGANIZATIONAL ELEMENTS.

a. Is it possible to summarize direct costs from the cost account level to the highest functional organizational level without allocation of a lower level organization's cost to two or more higher level organizations?

4. RECORD ALL INDIRECT COSTS WHICH WILL BE ALLOCATED TO THE CONTRACT.

a. Does the cost accumulation system provide for summarization of indirect costs from the point of allocation to the contract total?

- b. Are indirect costs accumulated for comparison with the corresponding budgets?
- c. Do the lines of authority for incurring indirect costs correspond to the lines of responsibility for management control of the same components of costs?
- d. Are indirect costs charged to the appropriate indirect pools and incurring organization?
- e. Are the bases and rates for allocating costs from each indirect pool consistently applied?
- f. Are the bases and rates for allocating costs from each indirect pool to commercial work consistent with those used to allocate such costs to government contracts?
- g. Are the rates for allocating costs from each indirect cost pool to contracts updated as necessary to assure a realistic monthly allocation of indirect costs without significant year end adjustments?
- h. Are the procedures for identifying indirect costs to incurring organizations, indirect cost pools, and allocating the costs from the pools to the contracts formally documented and followed?

5. IDENTIFY THE BASES FOR ALLOCATING THE COST OF APPORTIONED EFFORT.

- a. Is effort which is planned and controlled in direct relationship to cost accounts or work packages identified as apportioned effort?
- b. Are methods for applying apportioned effort costs to cost accounts applied consistently, and documented in an established procedure and followed?

6. IDENTIFY UNIT COSTS, EQUIVALENT UNIT COSTS, OR LOT COSTS AS APPLICABLE.

- a. Does the contractor's system provide unit costs, equivalent unit or lot costs in terms of labor, material, other direct, and indirect costs?
- b. Does the contractor have procedures which permit identification of recurring or nonrecurring costs as necessary and are they followed?

7. THE CONTRACTOR'S MATERIAL ACCOUNTING SYSTEM WILL PROVIDE FOR: ACCURATE COST ACCUMULATION AND ASSIGNMENT OF COSTS TO COST ACCOUNTS IN A MANNER CONSISTENT WITH THE BUDGETS, USING RECOGNIZED, ACCEPTABLE COSTING TECHNIQUES; DETERMINATION OF PRICE VARIANCES BY COMPARING PLANNED VERSUS ACTUAL COMMITMENTS; COST PERFORMANCE MEASUREMENT AT THE POINT IN TIME MOST SUITABLE FOR THE CATEGORY OF MATERIAL INVOLVED, BUT NOT EARLIER THAN THE TIME OF ACTUAL RECEIPT OF MATERIAL; DETERMINATION OF COST VARIANCES ATTRIBUTABLE TO THE EXCESS USAGE OF MATERIAL; DETERMINATION OF UNIT OR LOT COSTS WHEN APPLICABLE; AND FULL ACCOUNTABILITY FOR ALL MATERIAL PURCHASED FOR THE CONTRACT, INCLUDING THE RESIDUAL INVENTORY.

- a. Are material costs accounted for accurately and charged to cost accounts, consistent with the budgets therein, using recognized, acceptable costing techniques?
- b. Does the contractor's system provide for identifying material cost variances as to price variance and usage variance?
- c. Do the contractor's procedures for recording material costs permit and facilitate performance measurement?
- d. Are material costs reported within the same period as that in which BCWP is earned for that material?
- e. Are records maintained to show full accountability for all material purchased for the contract (including government furnished property and residual inventory)?

IV. ANALYSIS

1. IDENTIFY AT THE COST ACCOUNT LEVEL ON A MONTHLY BASIS USING DATA FROM OR RECONCILABLE WITH, THE ACCOUNTING AND BUDGETING SYSTEMS: BUDGETED COST FOR WORK SCHEDULED AND BUDGETED COST FOR WORK PERFORMED; BUDGETED COST FOR WORK PERFORMED AND APPLIED (ACTUAL WHERE APPROPRIATE) DIRECT COSTS FOR THE SAME WORK; BUDGETS AT COMPLETION AND ESTIMATES AT COMPLETION; AND VARIANCES RESULTING FROM THE ABOVE COMPARISONS CLASSIFIED IN TERMS OF LABOR, MATERIAL, OR OTHER APPROPRIATE ELEMENTS TOGETHER WITH THE REASONS FOR SIGNIFICANT VARIANCES, INCLUDING TECHNICAL PROBLEMS.

- a. Does the contractor's system include procedures for measuring performance of the organization responsible for the cost account and are they followed?
- b. Does the contractor's system include procedures for measuring the performance of critical subcontractors and are they followed?

- c. Is cost and schedule performance measurement done in a consistent, systematic manner?
- d. Are the actual costs used for variance analysis reconcilable with data from the accounting system?
- e. Is BCWP calculated in a manner consistent with the way work is planned (for example, if BCWS is planned on a measured basis, BCWP is calculated on a measured basis)?
- f. Does the contractor have variance analysis procedures and a demonstrated capability for identifying (at the cost account and other appropriate levels) cost, schedule, and at completion variances resulting from his system, which:
 - (1) Identify and isolate problems causing unfavorable variances?
 - (2) Evaluate the impact of schedule changes, work around, etc.?
 - (3) Evaluate the performance of operating organizations?
 - (4) Identify potential or actual overruns and underruns?

2. IDENTIFY ON A MONTHLY BASIS IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL, BUDGETED INDIRECT COSTS, ACTUAL INDIRECT COSTS, AND VARIANCES ALONG WITH THE REASONS.

- a. Are variances between budgeted and actual indirect costs identified and analyzed at the level of assigned responsibility for their control (indirect pool, department, etc.)?
- b. Does the contractor's cost control system provide for capability to identify the existence and causes of cost variances resulting from:
 - (1) Incurrence of actual indirect costs in excess of budgets, by element of expense?
 - (2) Changes in the direct base to which overhead costs are allocated?
- c. Are management actions taken to reduce indirect costs where there are significant adverse variances?

3. SUMMARIZE THE DATA ELEMENTS AND ASSOCIATED VARIANCES LISTED IN ITEMS 1. AND 2. ABOVE THROUGH THE CONTRACTOR ORGANIZATION AND CWBS TO THE REPORTING LEVEL SPECIFIED IN THE CONTRACT.

- a. Are data (BCWS, BCWP, ACWP, BAC, EAC, and their variances) progressively summarized from the cost account level to the contract level through the CWBS?
- b. Are the same data summarized through the functional organizational structure for progressively higher levels of management?

- c. Are the data reconcilable between internal summary reports and reports forwarded to the government?
- d. Are procedures for variance analysis documented and consistently applied at the cost account level and selected CWBS and organizational levels at least monthly as a routine task?

4. ON A MONTHLY BASIS IDENTIFY SIGNIFICANT DIFFERENCES BETWEEN PLANNED AND ACTUAL SCHEDULE ACCOMPLISHMENT AND THE REASONS.

- a. Does the scheduling system identify in a timely manner the status of work?
- b. Does the contractor use objective results, design reviews, and tests to track schedule performance?

5. IDENTIFY MANAGERIAL ACTIONS TAKEN AS A RESULT OF CRITERIA ITEMS 1. THRU 4. ABOVE.

- a. Are data disseminated to the contractor's managers timely, accurate and usable?
- b. Are data being used by managers in an effective manner to ascertain program or functional status to identify reasons for significant variances, and to initiate appropriate corrective action?
- c. Are there procedures for monitoring action items and corrective actions to the point of resolution and are these procedures being followed?

6. BASED ON PERFORMANCE TO DATE AND ON ESTIMATES OF FUTURE CONDITIONS, DEVELOP REVISED ESTIMATES AT COMPLETION FOR CWBS ELEMENTS IDENTIFIED IN THE CONTRACT AND COMPARE THESE WITH THE CONTRACT BUDGET BASE AND THE LATEST STATEMENT OF FUNDS REQUIREMENTS REPORTED TO THE GOVERNMENT.

- a. Are estimates at completion based on:
 - (1) Performance to date?
 - (2) Actual costs to date?
 - (3) Knowledgeable projections of future performance?
 - (4) Estimates of the cost for contract work remaining to be accomplished considering economic escalation?

b. Are the overhead rates used to develop the contract cost estimate to complete based on:

- (1) Historic experience?
- (2) Contemplated management improvements?
- (3) Projected economic escalation?
- (4) The anticipated business volume?

c. Are estimates at completion generated with sufficient frequency to provide identification of future cost problems in time for possible corrective or preventive actions by both the contractor and the government Project Manager?

d. Are estimates developed by contractor project personnel coordinated with top management to determine whether required resources will be available in accordance with revised planning?

e. Are estimates at completion generated by appropriate personnel for the following levels:

- (1) Cost accounts?
- (2) Major functional areas of contract effort?
- (3) Major subcontracts?
- (4) CWBS elements contractually specified for reporting of status to the government?
- (5) Total contract (all authorized work)?

f. Are the latest revised estimates at completion compared with the established budgets at appropriate levels and causes of variances identified?

g. Are estimates at completion generated in a consistent manner? Are there procedures established for appropriate aspects of generating estimates at completion and are they followed?

h. Are estimates at completion utilized in determining contract funding requirements and reporting them to the government?

i. Are the contractor's estimates at completion reconcilable with cost data reported to the government?

V. REVISIONS & ACCESS TO DATA

1. INCORPORATE CONTRACTUAL CHANGES IN A TIMELY MANNER AND RECORD THE EFFECTS OF SUCH CHANGES IN BUDGETS AND SCHEDULES. IN THE DIRECTED EFFORT BEFORE NEGOTIATION OF A CHANGE, BASE SUCH REVISIONS ON THE AMOUNT ESTIMATED AND BUDGETED TO THE FUNCTIONAL ORGANIZATIONS.

a. Are authorized changes being incorporated in a timely manner?

- b. Are all affected work authorizations, budgeting, and scheduling documents amended to properly reflect the effects of authorized changes?
- c. Are internal budgets for authorized, but not priced changes based on the contractor's resource plan for accomplishing the work?
- d. If current budgets for authorized changes do not sum to the negotiated cost for the changes, does the contractor compensate for the differences by revising the undistributed budget, management reserve budget, budgets established for work not yet started, or by a combination of these?

2. RECONCILE ORIGINAL BUDGETS FOR THOSE ELEMENTS OF THE CWBS IDENTIFIED AS PRICED LINE ITEMS IN THE CONTRACT, AND FOR THOSE ELEMENTS AT THE LOWEST LEVEL OF THE PROJECT SUMMARY WBS, WITH CURRENT PERFORMANCE MEASUREMENT BUDGETS IN TERMS OF CHANGES TO THE AUTHORIZED WORK AND INTERNAL REPLANNING IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL.

- a. Are current budgets resulting from changes to the authorized work and/or internal replanning, reconcilable to original budgets for specified reporting items?

3. PROHIBIT RETROACTIVE CHANGES TO RECORDS PERTAINING TO WORK PERFORMED THAT WILL CHANGE PREVIOUSLY REPORTED AMOUNTS FOR DIRECT COSTS, INDIRECT COSTS, OR BUDGETS, EXCEPT FOR CORRECTION OF ERRORS AND ROUTINE ACCOUNTING ADJUSTMENTS.

- a. Are retroactive changes to direct costs, and indirect costs prohibited and avoided, except for the correction of errors and routine accounting adjustments?
- b. Are direct or indirect cost adjustments being accomplished in accordance with accounting procedures acceptable to the Cognizant Auditor?
- c. Are retroactive changes to BCWS and BCWP prohibited except for correction of errors or for normal accounting adjustments?

4. PREVENT REVISIONS TO THE CONTRACT BUDGET BASE EXCEPT FOR GOVERNMENT DIRECTED CHANGES TO CONTRACTUAL EFFORT.

- a. Are procedures established to prevent changes to the contract budget base other than those authorized by contractual action and are they followed?

b. Is authorization of budgets in excess of the contract budget base controlled formally, accomplished in accordance with established procedures, and done with the full knowledge and recognition of the procuring activity?

5. DOCUMENT, INTERNALLY, CHANGES TO THE PERFORMANCE MEASUREMENT BASELINE AND, ON A TIMELY BASIS, NOTIFY THE GOVERNMENT PROJECT MANAGER THROUGH PRESCRIBED PROCEDURES.

a. Are changes to the performance measurement baseline made as a result of contractual redirection, application of undistributed budget, the use of management reserve budget, internal replanning, or formal reprogramming, properly documented and reflected in the Cost Performance Report and Project Status Report?

b. Are procedures in existence that restrict changes to budgets for open work packages and are these procedures adhered to?

c. Are retroactive changes to budgets for completed work specifically prohibited in an established procedure and is this procedure adhered to?

d. Are procedures in existence that control replanning of unopened work packages and are these procedures adhered to?

6. PROVIDE THE CONTRACTING OFFICER AND HIS DULY AUTHORIZED REPRESENTATIVES ACCESS TO ALL OF THE FOREGOING INFORMATION AND SUPPORTING DOCUMENTS.

a. Does the contractor provide access to all pertinent records to the review team and surveillance personnel?

ATTACHMENT 3

SAMPLE CSCSC SOLICITATION CLAUSE

NOTICE OF COST AND SCHEDULE CONTROL SYSTEMS

(a) The offeror shall submit a plan for compliance with the Criteria for the internal cost and schedule control systems (management control systems) which are and/or will be operational for any contract resulting from this solicitation which includes the Cost and Schedule Control Systems Contract Clause. The Criteria for contractors' cost and schedule control systems are set forth in DOE/CR-0015, Cost Schedule Control Systems Criteria for Contract Performance Measurement-Implementation Guide. The offeror shall identify existing management control systems separately from proposed modifications to meet the Criteria. The plan shall:

(i) describe the management control systems and their application in all major functional cost areas such as engineering, manufacturing, construction, etc., including their relationships to the Contract Work Breakdown Structure (CWBS);

(ii) describe the procedures for planning, budgeting, scheduling, work authorization, cost accumulation, measurement and reporting of cost and schedule performance, estimating of costs at completion, variance analyses, and baseline control, including their relationships to the major functional cost areas and the CWBS;

(iii) describe compliance with each of the Criteria*, preferably by cross-referencing the description of the management control systems with the items in the Criteria Checklist contained in DOE/CR2250/2;

(iv) identify the major subcontractors or major subcontracted effort in the event major subcontractors have not been selected, to whose management systems the Criteria will be applied; and

(v) describe the proposed procedures for administration of the Criteria when applied to subcontractors.

(b) If the contractor is utilizing management control systems which have been previously validated by the Department of Energy (DOE) or by the Department of Defense, or is operating such systems under a current Memorandum of Understanding with DOE, or the Department of Defense, evidence of such may be submitted in lieu of the plan mentioned above. In such an event, the Contracting Officer will determine the extent to which such systems shall be reviewed to assure continued compliance with the Criteria.

(c) The offeror shall provide information and assistance as requested by the Contracting Officer for evaluation of compliance with the cited Criteria.

* Note: DOE will identify any Criteria and/or Criteria checklist items which may be waived.

(d) The offeror's plan for compliance with the Criteria for cost and schedule control systems will be evaluated prior to contract award. Upon validation or acceptance of the cost and schedule control systems, a description of these systems will be referenced in the contract. Subsequent changes to the systems description shall be submitted for review and approval as required by the Contracting Officer.

(e) Subcontractor selection for application of the Criteria will be by agreement between the prime contractor and the government. The prime contractor will contractually require the selected subcontractors to comply with the Criteria. However, demonstration and reviews of these selected subcontractors' management control systems may be performed by DOE when requested by either the prime or subcontractor.

(f) Changes to contractor management control systems required to meet the cited Criteria shall be made at no direct cost to DOE.

ATTACHMENT 4

SAMPLE CSCSC CONTRACT CLAUSE

COST AND SCHEDULE CONTROL SYSTEMS

- (a) In the performance of this contract, the contractor shall establish, maintain, and use cost and schedule control systems (management control systems) meeting the Criteria* set forth in DOE/CR-0015, Cost and Schedule Control Systems Criteria for Contract Performance Measurement - Implementation Guide, annexed hereto and hereinafter referred to as the "Guide". Prior to acceptance by the Contracting Officer and within _____ calendar days after contract award, the contractor shall be prepared to demonstrate systems operation to the government to verify that the proposed systems meet the designated Criteria. As a part of the review procedures, the Contractor shall furnish the government a description of the cost and schedule control systems applicable to this contract in such form and detail as indicated by the Guide, or as required by the Contracting Officer. The Contractor agrees to provide access to all pertinent records, data, and plans as requested by representatives of the government for the conduct of systems review.
- (b) The description of the management control systems accepted by the Contracting Officer, identified by title and date, shall be referenced in the contract. Such systems shall be maintained and used by the contractor in the performance of this contract.
- (c) Contractor changes to the reviewed systems shall be submitted for review and approval as required by the Contracting Officer. When Contracting Officer approval is required, the Contracting Officer shall advise the contractor of the acceptability of such changes within sixty (60) days after receipt from the contractor. When systems existing at the time of contract award do not comply with the designated Criteria, adjustments necessary to assure compliance will be made at no change in contract price or fee.
- (d) The contractor agrees to provide access to all pertinent records and data requested by the Contracting Officer, or duly authorized representative, for the purpose of permitting government surveillance to insure continuing application of the accepted systems to this contract. Deviations from the systems description identified during contract performance shall be corrected as directed by the Contracting Officer.
- (e) The contractor shall require that each selected subcontractor, as mutually agreed to between the government and the contractor and as set forth in the schedule of this contract, meet the Criteria for cost and schedule control systems as set forth in the subcontract and shall incorporate in all such subcontracts adequate provisions for review and surveillance of subcontractors' systems to be carried out by the prime contractor, or by the government when requested by either the prime or subcontractor.

* Those Criteria and/or Criteria Checklist items which are applicable to the contract will be specifically identified by the Contracting Officer.

ATTACHMENT 5

EXAMPLE OF CSCSC MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding, entered into as of _____ (date) establishes a mutual agreement between the Department of Energy and (insert contractor's full name, including facility and location) regarding the implementation and maintenance of management control systems conforming to the Department of Energy established Cost and Schedule Control Systems Criteria (CSCSC) and as implemented by the DOE/CR-0015 Cost and Schedule Control Systems Criteria for Contract Performance Measurement-Implementation Guide.

Whereas, the contractor has demonstrated certain management control systems as identified and defined in (contractor's systems description dated _____), and

Whereas, the Department of Energy by letter dated _____, based on Demonstration Review Report dated _____, did validate such systems; then:

Be It Understood and Agreed that such systems which have been validated as indicated above, together with approved changes thereto, shall apply to future (specify type of contract, for example, Architect and Engineering, Construction, etc.) contracts entered into between the contractor and the Department of Energy which require compliance with the CSCSC; and

Be It Further Understood and Agreed that:

- (1) Contractor proposed changes to those validated systems will be submitted to the cognizant contracting office for review and approval or disapproval by the Contracting Officer.
- (2) The contractor agrees to provide access to pertinent records and data in order to permit adequate surveillance of the validated systems.

This Memorandum of Understanding will remain in force indefinitely, subject to modification by mutual agreement or termination by either party.

(Contractor)

(Contracting Officer)

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Department of Energy
Washington, DC 20585**

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