JOHN WOOD

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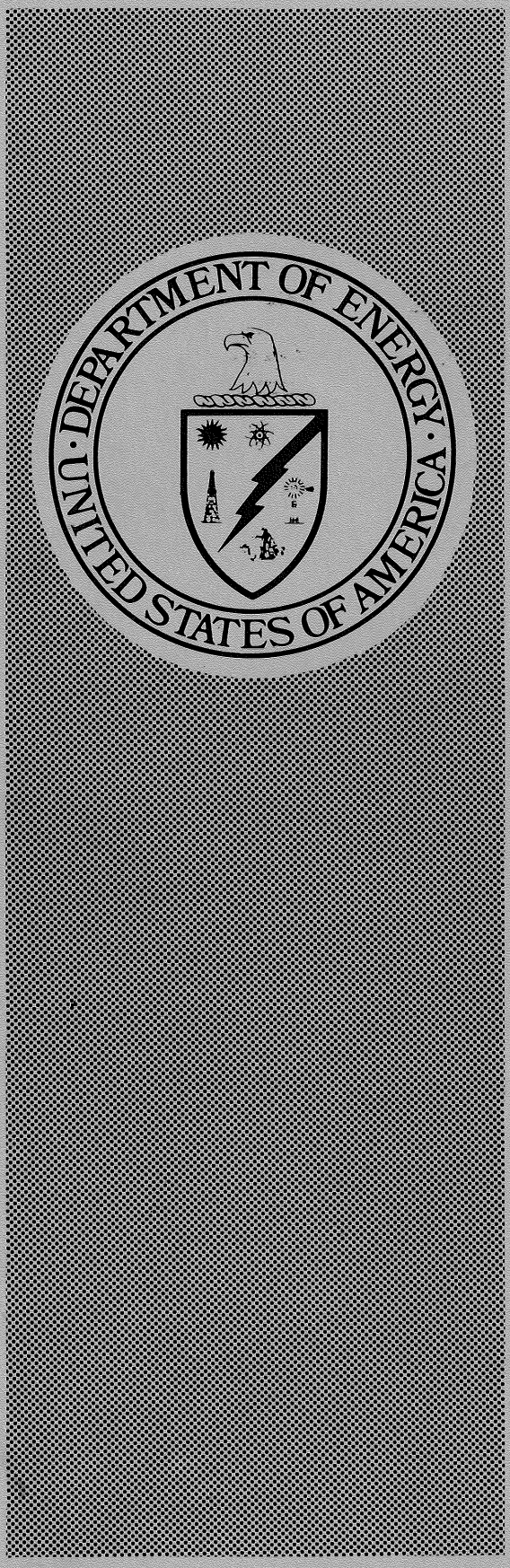

COST & SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT

IMPLEMENTATION GUIDE

U.S. DEPARTMENT OF ENERGY
OFFICE OF PROJECT AND
FACILITIES MANAGEMENT

January 1986

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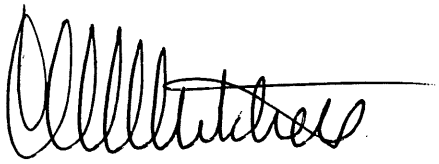
U.S. DEPARTMENT OF ENERGY
OFFICE OF PROJECT AND
FACILITIES MANAGEMENT
WASHINGTON, D.C. 20585

January 1986

FOREWORD

This document provides guidance for implementation of DOE Order 2250.1B, Cost and Schedule Control Systems Criteria (CSCSC) for Contract Performance Measurement. Its use assists DOE and contractor representatives in fulfilling their responsibilities for meeting CSCSC requirements. The CSCSC are designed to avoid the necessity for imposition of specific management control systems on contractors. Implementation of the CSCSC consistent with this guidance and compliance with the contractual requirements for work definition, cost and schedule control, and performance reporting provide DOE assurance that a contractor's cost and schedule progress is sufficiently visible to provide a reliable basis for timely and meaningful management decisions.

This is one of a series of DOE CSCSC guidance documents. Individual guides provide an overview and detailed guidance on systems review and surveillance and on contractor reporting and data analysis. Guidance on preparing and using a work breakdown structure is also provided in a separate DOE guide.



C. N. Mitchell, Director
Office of Project and
Facilities Management

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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 (Attachment 1) and provides DOE and its contractors and other participants with uniform guidance for CSCSC implementation in compliance with DOE Order 2250.1B. Implementation refers to the application of the CSCSC to specific contracts, the assessment of contractor's management control systems for compliance with the requirement, subsequent DOE systems validation or acceptance verifying the contractor's compliance, and systems surveillance to ensure continued compliance. Any supplemental instructions by individual DOE organizations will be consistent with the DOE Order and with this and other CSCSC guidance documents. A list of related DOE references is provided in Attachment 2.

This guide makes use of certain functional descriptors, for example, 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. The guide refers to contracts and contractors, although it may also apply to other contractual agreements and other participants, for example, a recipient of a DOE loan. Terms related to the CSCSC are defined in the Glossary of Terms, Attachment 3. In the case of a management and operating contractor, the CSCSC may be applied to only a portion of the work performed for DOE. For example, work on a line item plant and capital equipment construction project at a government owned contractor operated (GOCO) facility may be performed under the CSCSC while the remainder of the contractor's work is not. Work to be performed under the CSCSC would be as directed by the DOE contracting officer.

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, reviews, and analyzes 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 requirements. To be meaningful, the data submitted by contractors must:

- Portray time-phased budgets and estimates for specific scheduled contract tasks;
- Indicate work progress;
- Relate cost, schedule, and technical accomplishment and problems;
- 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 obtained from the same internal management control systems used by the contractor to manage the contract effort and determined by DOE to satisfy the CSCSC. 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 CSCSC in each solicitation and contract. The cost performance report, which presents 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 Order 1332.1A, Uniform Reporting System (URS). Additional details on the reports and their analysis are in the CSCSC Contractor Reporting/Data Analysis Guide and the URS Use of Data Guide.

C. CSCSC 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 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. Instead DOE has established the CSCSC as a set of criteria that contractors' management control systems must meet to be validated or accepted by DOE. 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 CSCSC. The end result is the use of contractor's management control systems to satisfy both the contractor's and DOE's needs.

The CSCSC are sufficiently general in nature to permit their use on almost any contract, including research, development, demonstration, construction, production, operations and maintenance, or management and operating. Since contracts differ significantly because of the work involved, value, type of contract, etc., it is impossible to provide detailed guidance which will apply in all cases. The reader should be alert for interpretations that seem appropriate or reasonable.

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 CSCSC set forth in DOE Order 2250.1B. The CSCSC 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 in general are required to:

- o Divide the effort into discrete items of assigned work within an agreed upon work breakdown structure;
- o Assign specific responsibility for the work within the organization structure;
- o Schedule the work using meaningful milestones to facilitate planning and the measurement of accomplishment;
- o Provide realistic budgets for increments of scheduled work to establish the baseline for contract performance measurement;
- o Measure consistently the planned value of work accomplished (earned value);
- o Control and accurately accumulate the costs related to planned progress of the work;
- o Provide comparisons between the earned value and the cost of the actual resources applied, and the planned value of work scheduled;
- o Develop reliable estimates of costs to complete the remaining in-scope work;
- o Support an overall capability for analysis of available information in order to identify problem areas in time to take remedial actions; and
- o Provide effective change control procedures to ensure baseline integrity.

E. BENEFITS OF CSCSC APPLICATION

Sensible use of the CSCSC approach provides benefits to both DOE and contractor management. DOE personnel gain a good working knowledge of the contractor's organization, systems operation and procedures, and the mechanics of report preparation. The standardization and discipline inherent in the CSCSC 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. On management and operating contracts DOE is assured that performance measurement is being measured against a formally agreed and documented baseline below the contract level. Finally, implementation of the CSCSC approach enhances overall project management by promoting the integration and effectiveness of the following interrelated activities:

- o Financial control (cost management, 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, technical risk management).

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 management levels.

F. JOINT PARTICIPATION

Successful contract performance measurement through use of management control systems which meet the CSCSC is the result of a combined and coordinated effort between DOE and the involved contractors. Futhermore, it requires the participation and coordinated efforts of various DOE organizational elements as described in Chapter III. 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 CSCSC is vested in the contractor, but the specific systems proposed are subject to DOE assessment and subsequent validation or acceptance. In instances where DOE determines that the contractor's systems do not meet the CSCSC, necessary adjustments to achieve compliance will be required. Differences in interpretation of CSCSC application between DOE representatives and a contractor which cannot be resolved locally should be directed to the Director, Office of Project and Facilities Management, 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 CSCSC, in accordance with DOE Order 2250.1B, may be applied in either a full or a modified version. They may be applied to contracts or, in the case of management and operating contracts, to specified projects within the contract. The basic difference between full and modified versions is the degree of latitude DOE exercises in specifying the CSCSC requirements and the subsequent determination of contractor compliance with the requirements. The modified implementation introduces additional flexibility into the implementation process to accommodate such contract factors as lesser dollar value, risk, criticality, or prominence.

The contract work selected for full CSCSC implementation will meet one of the following guidelines:

- o The contract work has a total estimated dollar value in excess of $50 million;

ACTIVITY	RESPONSIBLE PARTICIPANT	
	DOE	CONTRACTORS
Projects Designated to Apply CSCSC Approach on Contract	X	
Preliminary Project Summary Work Breakdown Structure (PSWBS) Developed	X	
Acquisition Strategy for Project Formulated	X	
Appropriate Contracts Selected for Full or Modified CSCSC Implementation	X	
CSCSC Implementation Requirements (Clauses, Reports, Reviews) Planned	X	
CSCSC Requirements Specified in Solicitation	X	
Systems Description and Contract Work Breakdown Structure (CWBS) Submitted in Proposal		X
Proposals Evaluated	X	
Contract Awarded with CSCSC Requirements in Contract Including Subcontracts Identified for CSCSC Implementation	X	
Implementation Activity Coordinated	X	X
Contractor's Management Control Systems Reviewed for Compliance with Contractual Requirements	X	
Discrepancies Identified During Review Corrected		X
Systems Acceptance Documented	X	
Systems Surveillance Performed	X	X
Systems Operated and Cost/Schedule Performance Reports Submitted		X
Performance Reports Analyzed and Results (Status Assessment, Trend Identification, and Forecasts) Used by Management	X	X

Figure 1. CSCSC Implementation Activities

- The contract work is of high national or DOE urgency or attracts unusually high national or DOE interest;

- The contract work has special problem areas or high risks that are expected to exist during the contract period; and

- The contract work has been recommended for full CSCSC implementation by a Program Office Director.

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

- The contract work has a total estimated dollar value between $5 million and $50 million;

- The contracted period of performance is more than one year; and

- The contract work has been recommended for modified CSCSC implementation by a Program Office Director.

Implementation of the CSCSC on an existing contract is subject to contractual agreement between the contractor and DOE. Subcontracts may be selected for application of the CSCSC 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 CSCSC. All other types of contracts, including fixed price incentive contracts, may have the CSCSC applied. Implementation of the CSCSC is not intended to affect the basis on which progress payments or cost reimbursements are made. The CSCSC do not address the basis for payment or cost reimbursement.

CHAPTER II

CRITERIA DISCUSSION

A. INTRODUCTION

The CSCSC explanations and interpretations contained in this chapter are intended to ensure the proper implementation of DOE's contract performance measurement requirements. The degree of rigor which accompanies contractor implementation of the CSCSC and the DOE review of a contractor's systems may vary to accomodate such contract factors as dollar value, risk, criticality, or prominence. Some potential differences are noted in the following paragraphs.

B. ORGANIZATION

The organization section of the CSCSC is concerned principally with definition of work to be performed under the CSCSC by the contractor and the assignment of tasks to contractor organizations responsible for performing the work. This section requires that all authorized work be defined within the framework of a contract work breakdown structure. The DOE 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 work breakdown structure (PSWBS) should reflect the contract scope of work on the project 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. Lower level elements should be meaningful products or task oriented subdivisions of higher level elements.

   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 various work phases, including design, fabrication, installation, construction, and operation and maintenance.

   Contractors may recommend and negotiate modifications to the preliminary CWBS. Contractors have complete flexibility in extending the negotiated CWBS to reflect their approach for 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 system more effectively, dummy levels are acceptable.

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 are completed. Additionally, construction is performed by work level and area, and it may be impractical for a constructor 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. Integration 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 integrated with each other; that is, functional responsibility is established for performing identified units of work. This integration may occur at any level, but the CSCSC 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.

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 variances are identified, that is, performance measurement is conducted. Some contractors may choose to collect costs and access performance variances at a still lower level.

CWBS LEVEL (See Fig. 3)	ORGANZATION 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

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.

As a key point for planning and controlling 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 ensure 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 contract performance will be directly relatable to the level and makeup of the cost accounts.

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 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.

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 organization and CWBS levels at which cost and schedule management responsibility actually exists. This avoids the generation of plans, documents, and performance reports which do not improve management control.

While all direct costs are accumulated in cost accounts, the CSCSC do not require the recording of indirect costs at this level. Contractors must be able to identify the managers responsible for controlling

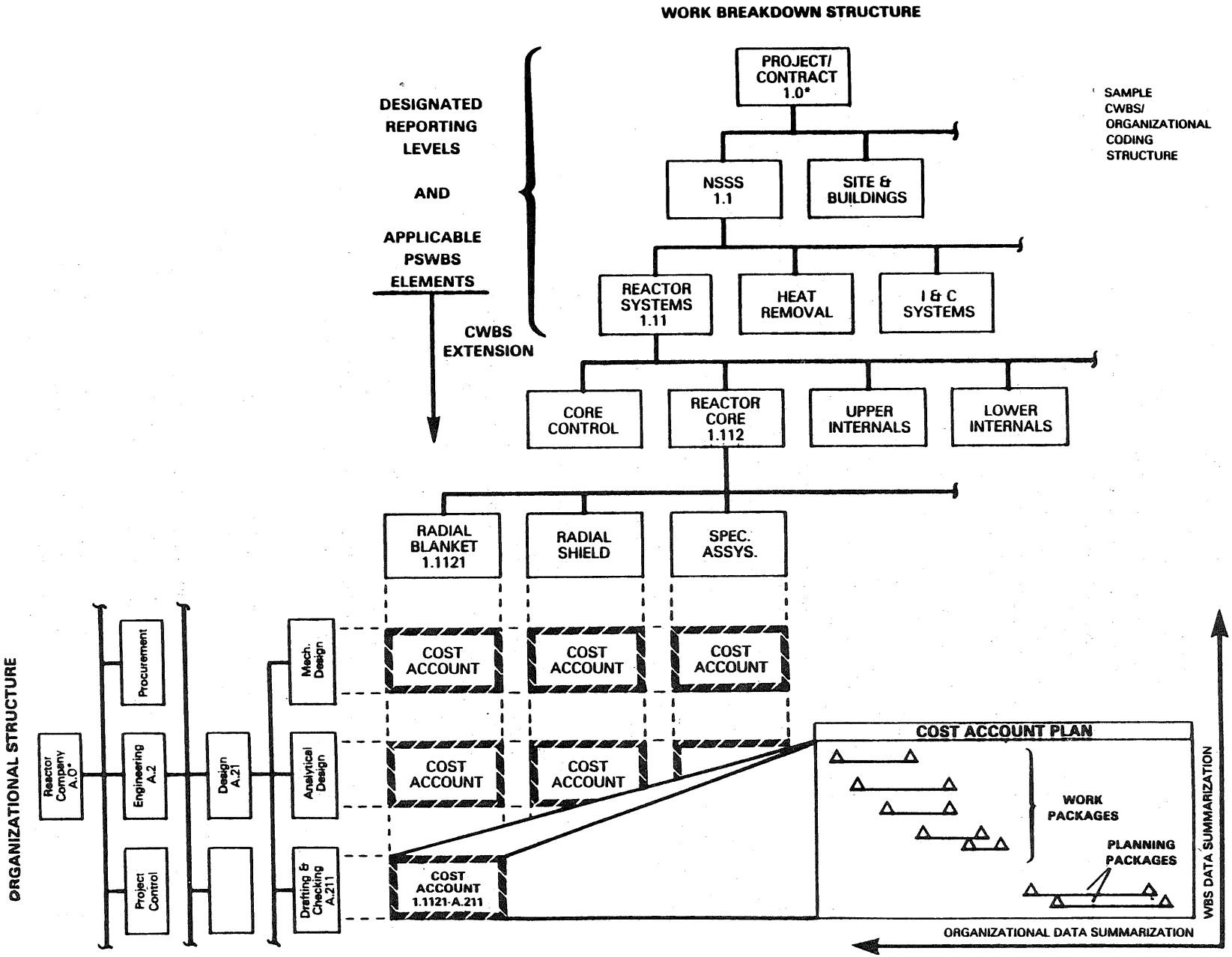


FIGURE 3 INTEGRATION OF WORK BREAKDOWN STRUCTURE AND ORGANIZATIONAL STRUCTURE

the indirect costs that are allocated to government contracts. Indirect budgets should be established and assigned to the 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.

At the cost account level all work must be planned in one of three different types of effort:

- o Discrete Effort - tasks which have a specific end product or end result;
- o Level of Effort (LOE) - work which does not result in a final product, that is, liaison, coordination, follow-up or other support activities; and
- o Apportioned Effort - factored effort which can be directly related to other discrete tasks, that is, portions of quality control or inspection.

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

4. Work Packages. In a full CSCSC 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 of Terms, Attachment 3. A work package should be a natural subdivision of effort planned according to the way the work will be done. Such planning should satisfy the requirements for performance measurement. In full CSCSC 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 CSCSC implementation, groups of tasks with objective indicators 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 a discrete task or a grouping of tasks having a definable end result and a single identification.

   Work packages vary significantly due to a variety of factors. 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, work packages for detail component fabrication 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 CSCSC do not impose specific limitations on work package duration. It should be recognized, however, that performance measurement is usually accomplished and

reported to DOE on a monthly basis. 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 provide 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 CSCSC 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. Methods frequently encountered include the following:

a. Zero percent of budget earned until work package is completed when one hundred percent of budget is earned.

b. Fifty percent of budget earned when work package is opened and fifty percent when completed.

c. Preplanned measurements of budget earned at preplanned milestones in work package progress.

5. Level of Effort. 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, that is, the BCWP is equal to the BCWS for the reporting period. LOE must be segregated from discrete work in order to maintain the integrity of the discrete work package measurement information. Normally, LOE costs are accumulated separately from discrete 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 CSCSC 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 discrete 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 and earned as apportioned effort based on the number of design drawings or amount of 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 are identified and the work is segregated into cost accounts and work packages. Thus, the contractual effort is progressively divided into smaller segments as work on the contract proceeds and as responsibility is assigned to successively 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.

C. PLANNING AND BUDGETING

Generally, the planning and budgeting section of the CSCSC 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.

   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 detail 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.

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 ensure 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.

In the case of authorized unpriced work, the contractor should plan and budget near term effort in cost accounts while the remaining 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, for example, 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 elements 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 should identify key milestones and activities which recognize significant constraints and relationships. Completion of the milestones must be objectively determinable. 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.

The CSCSC do not require the use of specific scheduling systems or methodologies. Basically, the CSCSC require the contractor's scheduling system to be formal, complete, and consistent. It should contain a summary of master schedule and related subordinate schedules

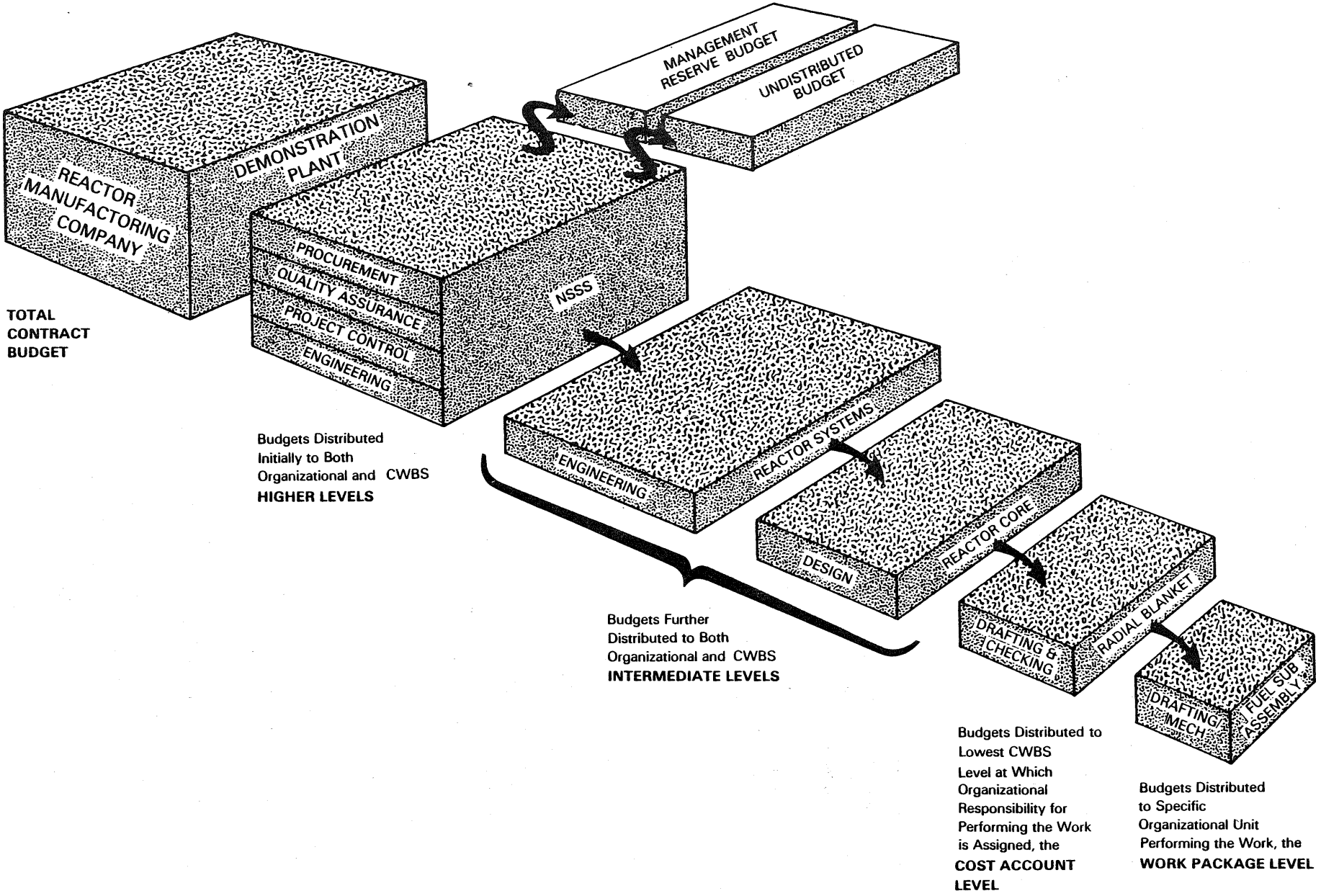
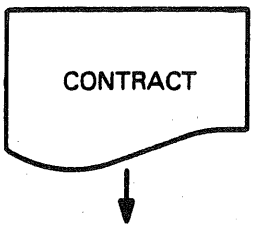


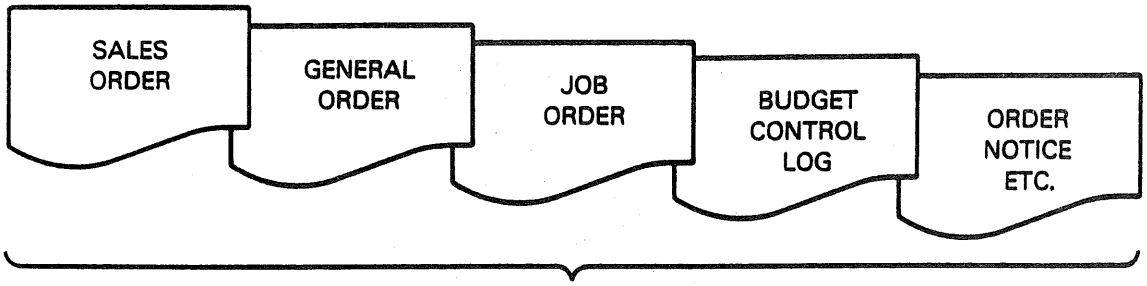
FIGURE 4 REPRESENTATIVE CONTRACT BUDGET DISTRIBUTION

DOE Project Office Work Authorization.
Authorization to Contractor to Perform to Contract Statement of Work



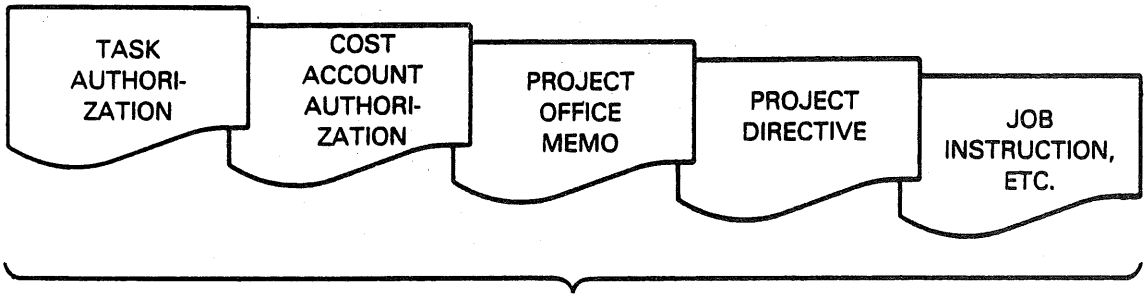
Typical Contractor Top Level Internal Work Authorization.
Authorization to, e.g., Contractor's Project Manager, to Perform Contract Planning, Budgeting, and Scheduling

EXAMPLES:



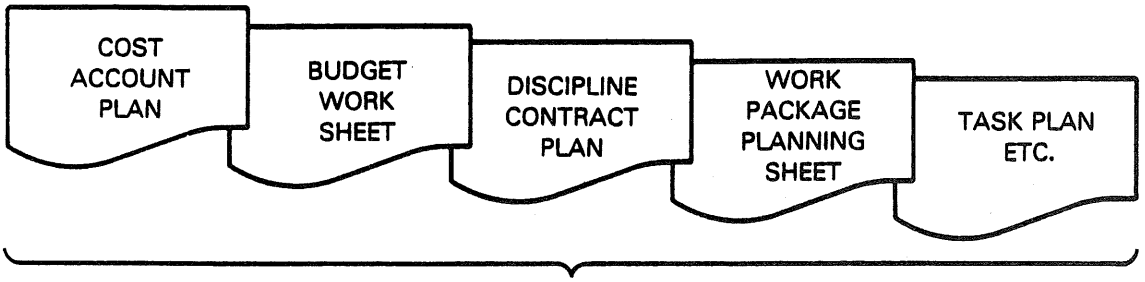
Typical Contractor Intermediate Level Internal Work Authorization.
Authorization from Contractor's Project Manager to, e.g., Cost Account Manager, to Plan, Budget, and Schedule Cost Account Scope of Work

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:

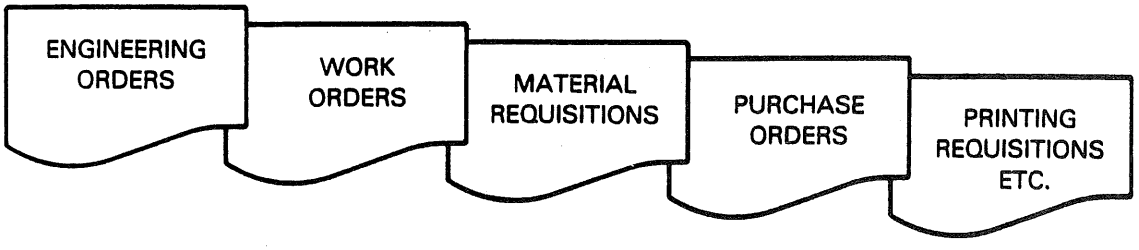


FIGURE 5 TYPICAL CONTRACTOR WORK AUTHORIZATION DOCUMENT FLOW

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. These may be supported by bar charts or other techniques at the work package level, 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.

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. 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.

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, 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 affected by the change, and opening of new work packages for each contract change, generally do not constitute a practical or economical approach. Under these conditions, rescheduling of the affected work in process may be appropriate and acceptable, providing procedures exist 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 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 CSCSC, provided that the measurement is integrated with the baseline plan for the performance of the work.

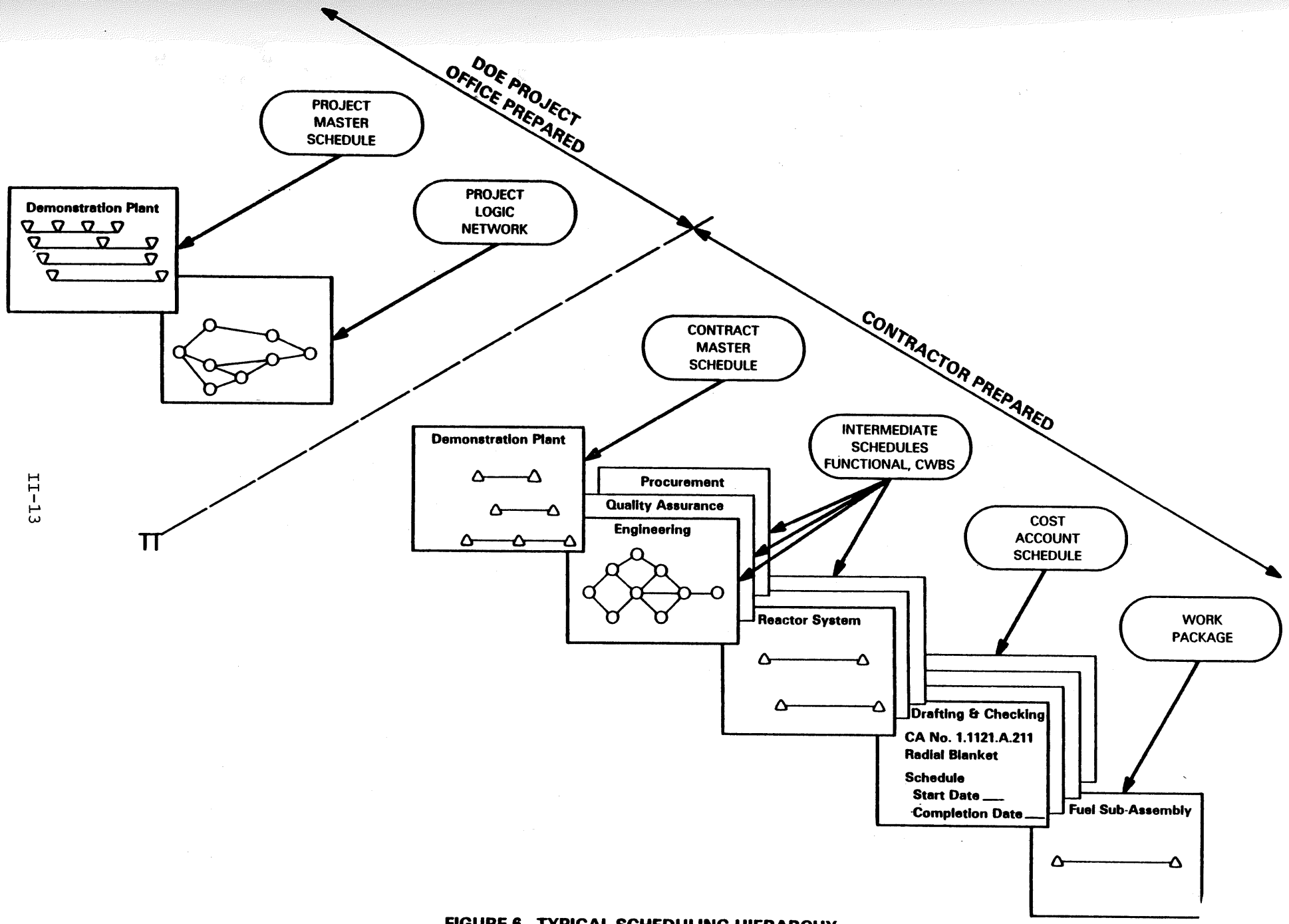


FIGURE 6 TYPICAL SCHEDULING HIERARCHY

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.

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, labor-hours, or other measurable units while budgets for cost accounts and higher levels are normally expressed in dollars. In general, the contractor's budgeting systems should provide for:

   - Direct budgets allocated to the organizations responsible for performing the planned work identified to CWBS elements;
   - Indirect budgets allocated to specific organizations having responsibility for controlling indirect costs;
   - Separate identification of any management reserve budget and undistributed budget; and
   - 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 which are 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, if indirect costs are applied at that level, greater 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 contract cost, 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 CSCSC purposes, this is called the contract budget base. 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 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. They form the major portion of the time phased budget baseline, that is, 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 detail planned through the "rolling wave" approach. When all work within a cost account is planned, the budgeted work must sum to 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).

   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 (e.g., labor, material, and other direct costs). 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

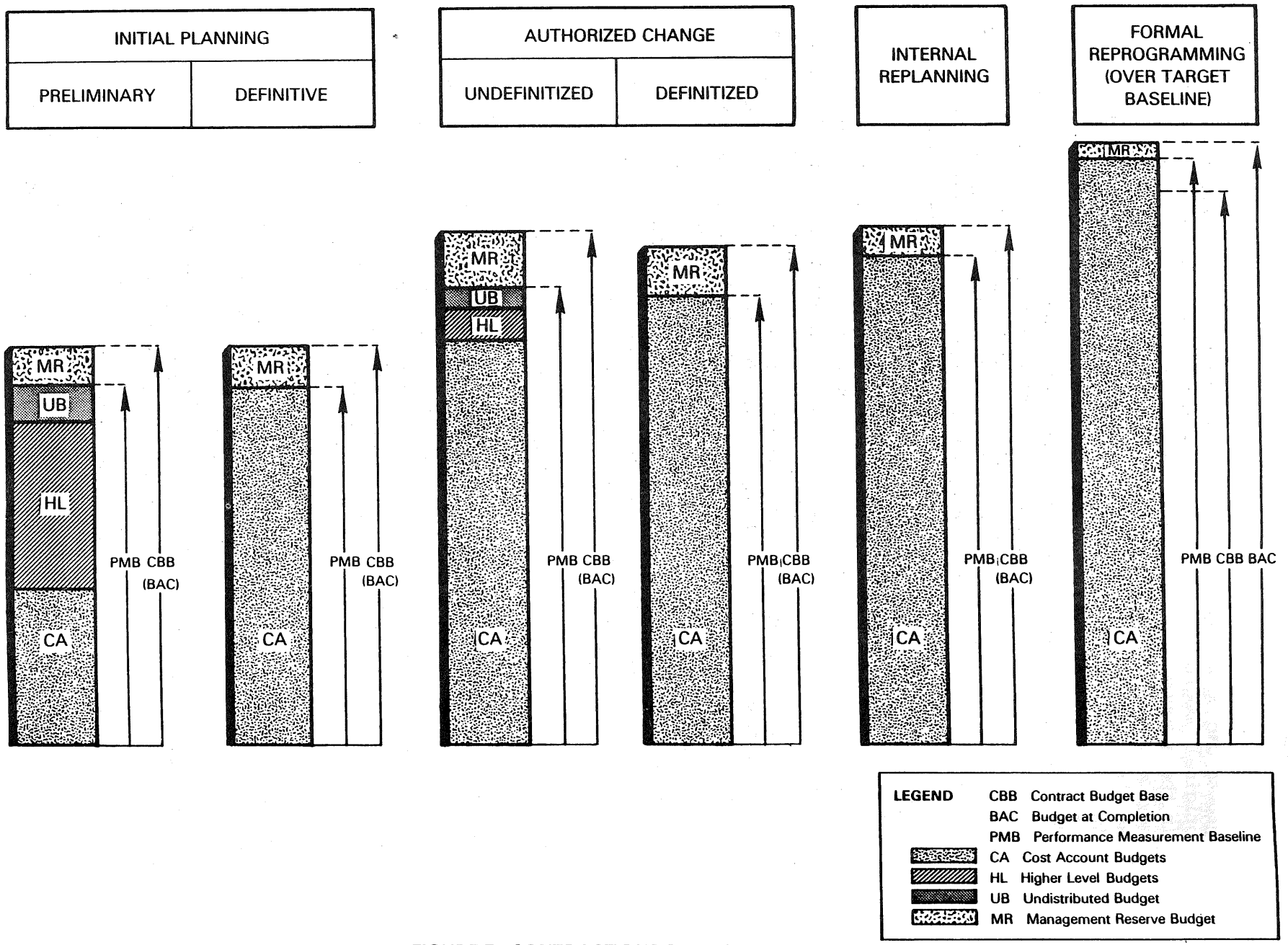


FIGURE 7 CONTRACT BUDGETING ACTIONS

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 near term work.

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, provided 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 through 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.

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 will equal the contract budget base.

Nothing in the CSCSC 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. However, 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.

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 one or twice during the life of a multiyear contract. One would not expect such an adjustment for instance on a contract with the limited duration of one year.

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 (CCO) 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 to maintain the integrity of the performance measurement baseline.

Usually, the establishment of undistributed budget will occur when 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. The budget should be distributed to appropriate cost accounts by the end of the next reporting period.

Undistributed budget may be established when 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. The CSCSC recognize that it is difficult for a contractor to foresee and plan all in-scope work and therefore, permit contractor establishment of a management reserve budget for such effort. The contractor's management reserve budget is that portion of the contract budget base withheld by the contractor for management control proposes rather than for budgeting a specific task or set of tasks. The contractor's management reserve budget is maintained separately from the performance measurement baseline budgets for budgeting in-scope work not identified or planned at the outset. The management reserve budget is not included as part of the performance measurement baseline because this would distort performance measurement of the known budgeted work. However, when management reserve budget is reduced and the reduction is applied to a specific task, the amount applied is included in the baseline. The management reserve budget is not to be confused with "funding contingencies" established and controlled by DOE or its management and operating contractor to cover contract costs that may result from incomplete design, unforeseen and unpredictable conditions, uncertainty, or potential cost increases associated with projected market condition changes. Management reserve budget also does not include undistributed budget. Budget is undistributed only when it has not been identified to levels below the reporting level.

   The Federal Acquisition Regulations require that any proposed contract costs be fully identified to known or anticipated contractual work in the proposal. Consequently, while the contractor's total proposed cost normally will allow for risk and similar considerations, these items will not be separately identified in the proposal. After contract award, the management reserve budget may be established by the contractor by withholding an appropriate part of the contract budget base when budget is distributed to identified tasks and organization elements. Management reserve budget is not, and need not be, separately identified in the contractor's prenegotiation planning or the negotiation phases of acquisition.

   The establishment of the original management reserve budget value, and subsequent changes thereto, must be made under controlled and disciplined conditions. Records must be maintained on the amount of budget set aside as management reserve and any application or increase must be accounted for by the contractor and reported to DOE. Normally, the contractor controls management reserve budget at the contract level. However, it may be distributed and controlled at lower management levels.

   The management reserve budget is established consistent with the contractor's normal practices for withholding part of a contract budget for unforeseen work. Past experience with similar work and some sort of risk analysis is usually involved. The management reserve budget value is not derived by subtracting the baseline budgets from the contract budget nor is it treated as a balancing figure for the purpose of remaining within the contract value. "Negative" management reserve budget to offset baseline budgets in excess of the contract value may not be used.

DOE knowledge of a contractor's management reserve budget cannot be used by DOE to avoid negotiation of amounts to which the contractor would be entitled. A contractor's management reserve budget cannot be treated as a DOE "contingency" which can be used to absorb the cost of DOE proposed out-of-scope contract changes. DOE acquisition activities should not definitize new work as no-cost changes, using the existence of a contractor's management reserve budget as the rationale.

DOE should not require the contractor to use management reserve budget to provide budgets for authorized but undefinitized work or other modifications to the authorized contractual effort. However, the contractor may elect to use management reserve budget to provide temporary budgets for authorized but undefinitized effort. Both DOE and the contractor should understand that the management reserve budget being used was derived from contractual effort negotiated and authorized prior to the contract change which is in process. After definitization of the contract change, depending on the results of the negotiations, the contractor may replenish the management reserve budget to its value prior to the change. Additionally, the contractor may set aside a part of the change as management reserve budget, thereby increasing the total management reserve budget.

The management reserve budget provides flexibility to the contractor in managing the contract work. It assists the contractor by permitting timeliness in budgeting unforeseen work, by maintaining and promoting systems discipline, and by providing a realistic budget for the unforeseen work to motivate employee performance. On the other hand, changes in management reserve budget can provide an indication of contract status and should be monitored. Management reserve budget activity furnishes visibility of the contractor's understanding and performance of the contractual work requirements. Frequent or extensive application of management reserve budget may indicate problems in either productivity or planning, or both. Techniques for analyzing management reserve budget application are contained in the DOE CSCSC Contractor Reporting/Data Analysis Guide.

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 URS cost performance report and 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 CSCSC 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 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.

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

   - An accurate cost accumulation system which assigns material costs to appropriate cost accounts in a manner consistent with the budget;
   - Recognized costing techniques acceptable to the cognizant auditor;
   - Capability to establish cost variances attributable to price variance and usage variance;
   - Performance measurement at the transaction point most suitable for the category of material involved; and

- 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.

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.

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 research and development 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 CSCSC require that contractor 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.

In those instances where the contractor maintains a separate stores inventory account, costs of "store" material or components will be relieved from the inventory account and charged as actual direct cost 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.

Actual material resources expended must be recorded on the same basis as budgeted, 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.

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:

   - Establishment of realistic time-phased budgets by organizations, that is, department or cost center;
   - Placement of responsibility for indirect costs in a manner commensurate with an individual's authority;
   - Monthly variance analyses and appropriate action to eliminate or reduce costs where feasible; and
   - 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 CSCSC set forth the characteristics which contractor 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 CSCSC 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, sometimes called planned value of work scheduled, 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, sometimes called earned value or planned value of work performed, 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 CSCSC do not specify any particular method to measure earned value because the technique used will largely depend on the work scope, value, and duration of the cost accounts and work packages. The major difficulty encountered in contractor determination of BCWP is the evaluation of work in process. Short-span work packages or discrete value milestones for longer duration work reduce the amount of work in process evaluation and facilitate objective earned value measurement. Formulae, earned standards, or physical assessments of work completed to determine the applicable budget earned are acceptable methods. The use of arbitrary formulae should be limited to work packages of relatively short duration, that is, 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, 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 CSCSC require that the contractor periodically develop a comprehensive estimate of cost at 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 ensure 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, cost account EACs 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. No specific time period for developing the comprehensive EAC is established by the CSCSC. However, it is expected that a comprehensive estimate will be prepared at least annually. This is usually done in support of current and future year funding requirements. However, it may be done more frequently whenever performance relative to the budget at completion, 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 in the URS status report. EACs should be developed 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.

   The comparison of BCWP with ACWP (cost variance) shows whether completed work has cost more or less than was planned for that work. Analysis of the cost variance should reveal factors contributing 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 from planned, personnel efficiency different from planned, or a combination of these or other reasons.

   The comparison of BCWP with BCWS (schedule variance) relates work completed to work scheduled during a given period of time. The schedule variance provides a valuable indication of schedule status in terms of dollars worth of work accomplished. However, 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.

Comparison of BAC with EAC represents a forecast of budget overrun or underrun. Analysis of this variance should identify the possible causes which may include redesign, change in scope, unrealistic EAC or BAC, lack of proper controls, or a combination of these or other reasons.

Comparison of BCWP with BCWS and with ACWP, and of EAC with BAC, is 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, thus 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.

When a subcontractor is required to comply with the CSCSC and to provide a cost performance report and 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 CSCSC, 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.

It is unnecessary and would prove unproductive to analyze every cost and schedule variance. Therefore, the contractor should establish internal cost and schedule variance thresholds and analyze only those variances which are significant, that is, 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 ensure 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 unfavorable variances, not attributable to any single major difficulty, but that add up to a significant overall schedule or cost problem will be evident. The same is true of the information to be reported to DOE.

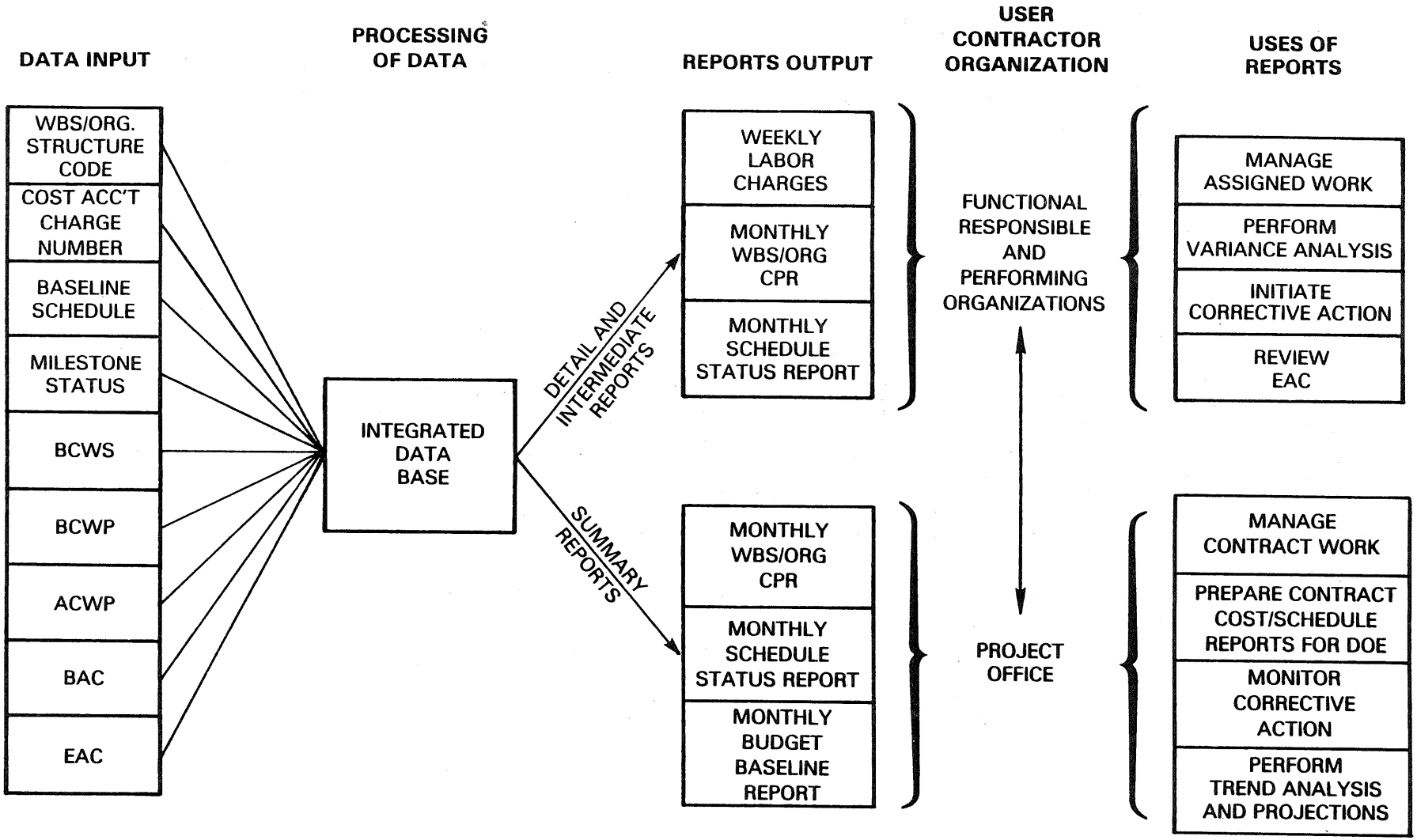


FIGURE 8 SAMPLE CONTRACTOR DATA FLOW FOR PERFORMANCE MEASUREMENT

The cost performance report provides data to DOE at a summary level, normally the third level of the CWBS 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 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.

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 to responsible cost account managers and promptly lead to corrective action. However, the reports to DOE should indicate the overall cost and schedule impact of such problems on the contract.

8. Technical Achievement. A key to effective cost and schedule control is correlation of technical achievement with accomplishment of specific work. If the PSWBS and the related CWBS 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 CPR should be supplemented by a narrative in the status report to explain the technical problems encountered and their impact.

   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, for example, redesign, scrap and remake, or 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 CSCSC 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, that is, schedule changes, 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.

   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.

   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 least at the lowest level of the PSWBS, or lower.

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.

   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 status report. This requirement is intended to assist all users in correctly understanding and interpreting the performance measurement baseline.

If the contractor proposes a change to budgets for either completed or in process work, for example, an adjustment for indirect cost application, the CCO 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, that is, 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 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 costs 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, available for reallocation to the remaining work. If the revised estimated cost to complete is significantly higher than the remaining budget, 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 Office of Project and Facilities Management. A contractor's request for formal reprogramming merely to compensate for variances already experienced should not be approved.

   As appropriate, contractor formal reprogramming may entail replanning in process and future 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.

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, for example, adjustments to variances 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, for example, the status of contractually specified project milestones, and cost share ratio where applicable.

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. The 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 (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 CCO 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 CSCSC as well as the composition and responsibilities of review teams.

B. DOE ORGANIZATIONAL RESPONSIBILITIES

1. Secretarial Officers. Program Assistant Secretaries and the Director, Office of Energy Research, are responsible for assuring that the CSCSC are implemented on new major system acquisition projects and for approving recommendations for, or designating implementation of, the CSCSC on major and other projects. The appropriate secretarial officer also designates a focal point for coordination of CSCSC matters with the Office of Project and Facilities Management, the DOE focal point.

2. Program Managers. Based on project managers' proposals and on their own identification of appropriate projects, program managers recommend to the appropriate secretarial officers projects for CSCSC implementation and ensure that in each case the approved project plan forms the basis for or includes CSCSC implementation planning. Upon completion of the evaluation of a contractor's systems, the program manager reviews the project manager's recommendation for validation and forwards it with appropriate endorsement to the Office of the Project and Facilities Management.

3. Heads of Field Organizations. Heads of field organizations support contractor's systems reviews within their purview, as well as surveillance activities associated with assuring continued acceptability of contractor's management control systems. They also ensure the inclusion of appropriate CSCSC requirements in solicitations and in contracts issued by their organizations. Each field office also designates a focal point for coordinating CSCSC matters with the Office of Project and Facilities Management.

4. Project Managers. DOE project managers apply the CSCSC on selected contracts supporting major system acquisition projects and on major and other projects that have been approved for CSCSC application. In coordination with the Office of Project and Facilities Management and with the cognizant Program Office, and using as a basis the PSWBS, and the technical, schedule, and cost baselines from the approved project plan, the appropriate project manager prepares CSCSC 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.

The project manager ensures inclusion of the CSCSC requirements in the solicitation and contractual documents and provides prospective contractors, through the CCO, with required CSCSC information. After contractor selection and in coordination with the Office of Project and Facilities Management and the cognizant CSCSC focal point, 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 Office of Project and Facilities Management through the cognizant program office under full CSCSC implementation, or notifies the Office of Project and Facilities Management through the cognizant program office of systems acceptance under modified CSCSC implementation.

Upon validation or acceptance, the project manager informs the cognizant contracting officer who, in turn, officially notifies the contractor that the cited CSCSC 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 CSCSC matters, the project manager requests through the cognizant program office that the Office of Project and Facilities Management arbitrate. Subsequently, the project manager arranges periodic systems surveillance to ensure continuing performance in accordance with the contractual requirements. Schedules developed for the conduct of surveillance reviews should be coordinated with the Office of Project and Facilities Management.

5. Inspector General. When requested or upon the office's own recognizance, the Inspector General inspects the contractor systems review process, the conduct of system surveillance activities, and the use of data for compliance with DOE policy and provides the inspection results to the responsible project office, program office, and the Office of Project and Facilities Management.

6. Assistant Secretary, Management and Administration. Based on the program manager's approval of the project managers recommendation for validation, the Assistant Secretary, Management and Administration, prepares and issues the official certificate of validation to be forwarded to the validated contractor.

7. Director of Personnel. The Director of Personnel develops or arranges training programs for applying the CSCSC contractually, reviewing contractor CSCSC implementations, analyzing contractors' cost and schedule performance reports; and conducting systems surveillance.

8. The Director of Project and Facilities Management. The Director of Project and Facilities Management provides the DOE focal point for the CSCSC and their interpretation, application, and interagency coordination. These functions include: defining the DOE CSCSC; developing DOE policy for CSCSC use and applications; developing guides, information pamphlets and other documentation to assist in CSCSC

implementation; resolving significant problems encountered during system reviews and surveillance; and reviewing and approving project managers' recommendations for validation.

To maximize use of available resources, the Office of Project and Facilities Management advises and assists participating DOE organizations in organizing and carrying out contractor's 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 CSCSC, the Office of Project and Facilities Management also provides review directors to assist in the reviews of contractors' CSCSC implementations and provides other review team personnel when requested.

To aid in consistent and expeditious system reviews, the Office of Project and Facilities Management maintains a listing of qualified DOE personnel to serve on review teams, and coordinates their availability. To accelerate and broaden DOE experience the Office of Project and Facilities Management may arrange for DOE personnel to participate in other government agency reviews.

Additionally, the Office of Project and Facilities Management maintains records of CSCSC implementations by DOE contractors, exchanges such status information with other government agencies, and provides this information to the other focal points for their use.

9. Director, Procurement and Assistance Management. The Director, Procurement and Assistance Management, develops and provides procurement regulations or implementing clauses for use in solicitation documents and contracts; provides assistance in solving contractual implementation problems; and through the director(s) of procurement/head(s) of the contracting activity, includes criteria implementation requirements in appropriate requests for proposal and contracts. The Director also supports contractor systems reviews and surveillance activities and designates a focal point for coordination of CSCSC matters with the Office of Project and Facilities Management.

10. Other Participants. The implementation of the CSCSC also involves two other specialized functions. These functions are performed by the CCO and cognizant auditor. Their responsibilities are discussed below:

The CCO represents the DOE office responsible for administering the contractual activities under the contract on which the CSCSC are being or have been implemented. The contract administration function may be located at an operations office, project office, site office or headquarters, depending on the project. The cognizant contracting officer supports CSCSC implementation and subsequent systems surveillance, as appropriate.

The cognizant auditor represents the audit organization (DOE operations office, Defense Contract Audit Agency, etc.) responsible for auditing the DOE contract on which the CSCSC are being or have been implemented. The cognizant auditor is responsible for conducting audits of the contractor's accounting system policies and procedures for compliance with the CSCSC. It is desirable that the cognizant auditor participate in CSCSC 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 cognizant CSCSC focal point and the Office of Project and Facilities Management, will organize a team of qualified individuals to conduct the on site review of the contractor's management control systems and arrange the review schedule. The purpose of these reviews is to verify that the contractor is operating systems which meet the contractual CSCSC requirements.

1. Team Composition. The review team is composed of appropriate representatives from the project office, Office of Project and Facilities Management, field office, CCO, cognizant officer, and cognizant program office, with each member assigned specific review responsibility. The Office of Project and Facilities Management 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, nature of project, etc.). As soon as a review schedule is developed, the Office of Project and Facilities Management notifies all participants as far in advance as possible concerning the starting date and the planned duration of the review.

   The review director, appointed by the Office of Project and Facilities Management 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 CSCSC use and application. Typical activities include assisting in overall review planning and review team selection, interpreting the DOE CSCSC, policy and requirements, evaluating contractor earned value techniques, and consulting on review report preparation.

   The team chief, appointed by the project manager in coordination with the Office of Project and Facilities Management, 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.

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 have both knowledge of the CSCSC and prior review experience in addition to possessing one or more of the following qualifications:

- o Knowledge of the technical content of the project or contract;
- o Knowledge of the processes (for example, design, manufacture, construction, etc.) 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 analysis/cost/price analysis experience;
- o Contract negotiation or administration experience;
- o Material control/inventory control/logistics 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 CSCSC 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 CSCSC. The contractor will be afforded an opportunity to correct any of the systems' deficiencies found.

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.

The team chief makes all necessary arrangements to ensure that team members are available for the preliminary coordination required 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 or others, and may be supplemented by additional instruction to ensure the fullest understanding of the task to be performed during the review. The Defense Systems Management College, Fort Belvoir, VA; the Air Force Institute of Technology, Wright-Patterson Air Force Base, Akron, OH; and the U.S. Army Management Engineering Training Activity, Rock Island, IL conduct CSCSC training courses for government and contractor personnel. On-the-job training will be provided, when feasible, to enlarge upon background experience and classroom training, for occasional members without prior review participation.

CHAPTER IV

IMPLEMENTATION REVIEW PROCEDURES

A. INTRODUCTION

This chapter provides guidance to DOE representatives for conducting a review of contractor systems under either a full or modified CSCSC 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 also serve as a reference for contractors in preparing their systems descriptions, in order to facilitate more effective assessment of their systems by DOE representatives. Additional guidance for systems reviews and continued surveillance of contractor systems is contained in the DOE CSCSC 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 Actions. After it is determined that the CSCSC will be applied on a contract, the requirements will be included in the solicitation document. The clause for this purpose is contained in the Department of Energy Acquisition Regulations (DEAR). It is included in Attachment 4. 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 CSCSC requirements. Contractors may propose to use the existing systems which in their judgment meet the CSCSC.

   The contractor's management control systems must be described in sufficient detail to determine compliance with the CSCSC and subsequently permit adequate surveillance of the operating systems. Contractors must show clearly how their systems meet DOE requirements. While the contractor's systems description is not expected to follow the CSCSC (Attachment 1), the contractor should correlate the description with the CSCSC to ensure 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.

   Contractors proposing to use previously validated management control systems may satisfy the CSCSC requirements in the solicitation document by citing in their proposal the memorandum of understanding or certificate of validation.

A. GENERAL

1. Company Policy for Cost/Schedule Performance
2. Administration of Policy
3. System Summary

B. ORGANIZATION

1. Contract Work Breakdown Structure Development Procedures
2. Project Organizational Structure and Responsibility
3. Integration of Contract Work Breakdown Structure With Organizational Structure
4. Integration of Planning, Scheduling, Budgeting, Work Authorization, and Data Accumulation Systems
5. Subcontract Identification and Control

C. PLANNING AND BUDGETING

1. Work Authorization
2. Schedule Development and Control
3. Cost Account/Work Package Development and Planning
4. Establishment of Performance Measurement Baseline
5. Overhead Planning and Budgeting
6. Management Reserve Control Procedures
7. Undistributed Budget Control Procedures

D. ACCOUNTING

1. Procedures
2. Elements of Cost
3. Material Cost Control
4. Purchase Order System
5. Data Base Description
6. Recurring/Nonrecurring Costs
7. Overhead Procedures
8. Data Reconciliation

E. ANALYSIS

1. Earned Value Meaning, Calculation, and Use
2. Comparison of Actual Versus Planned Performance
3. Variance Analysis Procedures
4. Estimate at Completion Derivation

F. REVISIONS AND ACCESS TO DATA

1. Baseline Maintenance
2. Change Incorporation
3. Internal Replanning
4. Formal Reprogramming
5. Internal and External Reporting Procedures
6. Systems Surveillance
7. Access to Data

Figure 9. Example Outline Management Control Systems Description

Normally, for a new contract requiring the CSCSC, the CSCSC evaluation review is accomplished as a part of the precontract award procedures whether a formal source evaluation board (SEB) is required or not. The CSCSC portion of the review consists of evaluating proposed or existing systems and methods by which prospective contractors plan to comply with the CSCSC 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. 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 CSCSC requirements. If not, the report will identify specific deficiencies. It will also rate the contractors according to their ability to satisfy the CSCSC. When the CSCSC apply to a HQ awarded contract, OPFM is responsible for the evaluation. It is usually performed by the CSCSC team director. For contracts awarded by an Operations Office, the cognizant CSCSC focal point is normally responsible.

2. Contract Award. The contract will require that the contractor's systems comply with the CSCSC requirements throughout performance of the contract. The DEAR contains a contract clause covering the CSCSC requirements. It is shown in Attachment 5.

The clause requires the contractor to establish, document, demonstrate, and use management control systems in accordance with the cited CSCSC. 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.

When the CSCSC 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 CSCSC and incorporate adequate provisions for systems review and surveillance. Subcontracts selected for application of the CSCSC 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 control 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.

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 the Office of Project and Facilities Management. 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 CSCSC requirements are being met.

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.

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 CSCSC. The purpose of succeeding visits is 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 CSCSC 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 CSCSC 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. 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.

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 CSCSC requirements and the work under contract will be made available. 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. The burden of proof for demonstrating compliance with the CSCSC 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 CSCSC (Attachment 1) to ensure that an orderly, comprehensive, penetrating and conclusive review is conducted. A checklist which includes the CSCSC, followed by specific questions, can be used to assist in interpreting the contractor's compliance with each of the CSCSC.

   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.

   The responsibility for assuring that a contractor's indirect cost control system is in compliance with the CSCSC 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 CSCSC, 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 CSCSC requirements and if the team recommends the contractor's systems for validation. If they do not comply, the report will identify the areas of noncompliance 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. The DOE CSCSC Systems Review/Surveillance Guide discusses in 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 Office of Project and Facilities Management. 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 program office. The program office will then review the report and, if it concurs, forward its recommendation to the Office of Project and Facilities Management, which then prepares a certificate of validation. After the Office of Project and Facilities Management's approval, the Assistant Secretary, Management and Administration, will issue the certificate of validation to be presented to the contractor documenting that the contractor's systems comply with the CSCSC. The CCO will officially notify the contractor that the contractor's systems have complied with the CSCSC requirements in the contract and provide the contractor with copies of the demonstration review report. Once a contractor is validated, the demonstration of systems operation upon award of a new contract with the CSCSC requirements is normally not required.

   Overall responsibility for the control of distribution of reports within DOE rests with the project office. However, contents, in whole or in part, will not be disseminated outside DOE without the express permission of the Office of Project and Facilities Management and the contractor. When applicable, the cover page of each demonstration review report will contain a statement indicating that the report contains contractor proprietary data, and that distribution of copies will be restricted.

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.

   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, it should be prepared in a format which references or summarizes subsidiary documents. Contractor proposed changes to validated management control systems will be submitted to the CCO for approval prior to incorporation. Surveillance to assure that contractors maintain compliance will be accomplished by the project office in coordination with the program office, field office, cognizant contracting officer, and cognizant

auditor. Responsibility for overall coordination of this surveillance rests with the project office. 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. These topics are discussed more fully in the DOE Cost and Schedule Control Systems Criteria for Contract Performance Measurement - Systems Review/Surveillance Guide.

8. Subsequent Applications. A Memorandum of Understanding (MOU), which references the validated systems description, may be used to apply the systems to other contracts with CSCSC requirements. An example is shown in Attachment 6. A contractor may respond to solicitations for potential contracts by citing the MOU 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 CSCSC 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 Office of Project and Facilities Management.

C. MODIFIED IMPLEMENTATION

1. Preaward Actions. When the CSCSC are to be implemented on a modified basis, the requirement is detailed in the solicitation document and contract in a manner similar to full CSCSC implementation. The sample clauses contained in Attachment 4 and 5 can be tailored to state the modified requirements. Any of the CSCSC not deemed applicable should be specified in the clause as exemptions. Proposal evaluation and subcontract application follows the procedures described for full CSCSC implementation in Paragraph IV.B.

   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 CSCSC implementation required for effective project management. The project manager is encouraged to request advice and assistance in these matters from the Office of Project and Facilities Management.

   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 or accepted this should be cited in the proposal. For existing contracts, modified CSCSC implementation may be accomplished by binding agreement between DOE and the participating contractor.

2. Post Award Actions. The scope of review activities under modified CSCSC 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 $5 million. Similarly, a high technical risk contract will demand more attention than one with minimal risk. Thus, exact guidelines cannot be given. However, to make effective use of contractor reports, the project manager should clearly understand the operation of the contractor's systems generating the reports and should verify that they are operating in accordance with the stated CSCSC requirements. In order to accomplish this goal, the project manager arranges for a series of reviews which will demonstrate the effectiveness of the contractor's management control systems.

The project manager should, prior to any visits to the contractor's facility:

- Identify an appropriate DOE team chief for the modified review process;
- Identify appropriate DOE representatives who should participate in the review;
- Familiarize the representatives with the specified CSCSC requirements and the techniques the contractor proposes to use for compliance with the requirements;
- Advise the Office of Project and Facilities Management of planned activities and request assistance, if needed; and
- Schedule an implementation visit with the contractor's facility.

  a. Implementation Visit. The purpose of the implementation visit, as for a full implementation, is to review the contractor's plan for implementation, provide an opportunity for selected members of the DOE review team, under the team chief, to examine selected documents and procedures proposed by the contractor, and to identify areas of noncompliance or potential problems to the contractor. During the visit, the project manager will develop a schedule for the preacceptance review and the acceptance review. Results of the visit should be documented by the team chief.

  b. Preacceptance Review. The preacceptance review provides the DOE review team, under the team chief, the opportunity to review progress toward implementing the CSCSC requirements, to clarify misunderstandings, and, most importantly, to assess contractor readiness to demonstrate fully integrated and compliant management control systems. The preacceptance review, although it should not involve the time and expense of the full DOE and contractor review team, assists in preparation for the acceptance review by familiarizing key team members with the basics of the contractor's systems, and by identifying discrepancies that should be corrected prior to the acceptance review. The results of the preacceptance review should be documented by the team chief.

c. Acceptance Review. During the acceptance review, the DOE review team should verify 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. It should also review internal contractor management control reports that support external reporting and 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. The team should also agree on how contractor proposed changes to the management control systems will be processed.

3. Acceptance Review Report. After the acceptance review, the team chief should prepare the acceptance review report for the DOE project manager, which should document systems operation by CSCSC category and agreements on corrective actions to be taken by the contractor, if any.

The project manager then notifies the Office of Project and Facilities Management through the cognizant program office of the acceptance of the contractor's systems for successfully implementing the modified CSCSC for the specific project, and informs the cognizant contracting officer who notifies the contractor that the modified CSCSC implementation requirements have been satisfied. The DOE project manager should also arrange for surveillance requirements and, if necessary, monitor contractor corrective actions.

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 CSCSC requirements throughout the contract's duration. This is accomplished by agreement with on site personnel (e.g., representatives of the CCO 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 the DOE CSCSC 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 CSCSC requirements, indicating a need for modification and improvement. The second phase begins after the contractor's operational systems have been validated or accepted.

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.

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, DOE should direct the contractor to take the action necessary to rectify the situation.

CHAPTER V

IMPLEMENTATION PLAN

A. PREPARATION

The project manager will prepare a project CSCSC Implementation Plan following the outline in Figure 1Ø. The plan will be prepared for incorporation in the Project Management Plan. An example CSCSC Implementation Plan is provided in Attachment 7.

I. Introduction

- A. Purpose
- B. Scope

II. Participating Organizations

- A. Project Management
- B. Cognizant Secretarial Official
- C. Cognizant Field Office
- D. Cognizant Contract Office
- E. Cognizant Auditor

Attachments

1. Project Summary Work Breakdown Structure
2. Contract Designations
3. Schedule of Implementation Activities
4. Review Team

Figure 1Ø. Implementation Plan Outline

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.

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 CONTRACT WORK BREAKDOWN STRUCTURE, 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 CONTRACT WORK BREAKDOWN STRUCTURE WITH THE CONTRACTOR'S FUNCTIONAL ORGANIZATIONAL STRUCTURE IN A MANNER THAT PERMITS COST AND SCHEDULE PERFORMANCE MEASUREMENT FOR CONTRACT WORK BREAKDOWN STRUCTURE 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 INTERDEPENDENCIES 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 accomplishment against the schedule plan?

c. Are current work performance indicators and goals relatable to original goals as modified by contractual changes, replanning, and reprogramming 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, AND SO FORTH).

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?

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5. TO THE EXTENT THE AUTHORIZED WORK CAN BE IDENTIFIED IN DISCRETE, SHORT-SPAN 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 LONG-TERM EFFORT IN LARGER PLANNING PACKAGES FOR BUDGET AND SCHEDULING PURPOSES.

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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 ACTIVITY BY TIME-PHASED BUDGETS ESTABLISHED FOR THIS PURPOSE. ONLY THAT EFFORT WHICH CANNOT BE IDENTIFIED AS DISCRETE, SHORT-SPAN WORK PACKAGES OR AS APPORTIONED EFFORT WILL BE CLASSED AS LEVEL OF EFFORT.

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 RESERVES 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 TARGET COST PLUS ESTIMATED COST OF AUTHORIZED BUT UNPRICED WORK IS RECONCILED WITH THE SUM OF ALL INTERNAL CONTRACT BUDGETS AND MANAGEMENT RESERVES.

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 WORK BREAKDOWN STRUCTURE WITHOUT ALLOCATION OF A SINGLE COST ACCOUNT TO TWO OR MORE WORK BREAKDOWN STRUCTURE 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 NO 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 the 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?

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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.

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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?

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3. SUMMARIZE THE DATA ELEMENTS AND ASSOCIATED VARIANCES LISTED IN PARAGRAPHS 1 AND 2, ABOVE, THROUGH THE CONTRACTOR ORGANIZATION AND WORK BREAKDOWN STRUCTURE 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 lease monthly as a routine task?

4. IDENTIFY SIGNIFICANT DIFFERENCES ON A MONTHLY BASIS BETWEEN PLANNED AND ACTUAL SCHEDULE ACCOMPLISHMENTS TOGETHER WITH 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 PARAGRAPHS 1 THROUGH 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 OF COST AT COMPLETION FOR WORK BREAKDOWN STRUCTURE 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 contract 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 RECORDING 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?

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2. RECONCILE ORIGINAL BUDGETS FOR THOSE ELEMENTS OF THE WORK BREAKDOWN STRUCTURE IDENTIFIED AS PRICED LINE ITEMS IN THE CONTRACT, AND FOR THOSE ELEMENTS AT THE LOWEST LEVEL OF THE PROJECT SUMMARY WORK BREAKDOWN STRUCTURE, 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.

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

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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.

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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?

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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?

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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 CONTRACTING OFFICER 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 OR HER 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 2

DOE CSCSC REFERENCE DOCUMENTS

1. ORDERS

   a. DOE 2250.1B, COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT.

      Establishes the Department of Energy (DOE) policy for applying and using the Cost and Schedule Control Systems Criteria on DOE major system acquisition, major, and other projects.

   b. DOE 1332.1A, UNIFORM REPORTING SYSTEM.

      Establishes the DOE policy for establishing reporting requirements for contracts, loans, and loan guarantees, and provides forms, formats, instructions, and procedures for reporting essential management information.

2. GUIDES

   a. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - SUMMARY DESCRIPTION.

      Provides an overview of the DOE Criteria approach for contract performance measurement. It was prepared to assist both DOE and industry personnel in understanding and using the CSCSC approach properly.

   b. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - SYSTEMS REVIEW/SURVEILLANCE GUIDE.

      Provides guidance to DOE personnel in conducting acceptance and validation reviews and subsequent surveillance reviews of contractors' systems to assure initial and continued compliance with the CSCSC.

   c. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - CONTRACTOR REPORTING/DATA ANALYSIS GUIDE.

      Provides suggested techniques for analyzing contractor cost and schedule data which should give insight into the current contract performance status and help forecast future contract performance.

   d. WORK BREAKDOWN STRUCTURE GUIDE

      Provides guidance for use of the work breakdown structure technique for work identification and definition.

   e. UNIFORM REPORTING SYSTEM - USE OF DATA GUIDE

      Provides guidance on review, analysis, and assessment of URS data.

3. INFORMATION PAMPHLETS

a. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - INFORMATION PAMPHLET.

Provides a narrative and graphic illustration of the basic concepts and general requirements of CSCSC.

b. CONTRACT PERFORMANCE MEASUREMENT REPORTING AND BASELINE MANAGEMENT - INFORMATION PAMPHLET.

Provides a narrative and graphic illustration of performance measurement reporting and baseline management.

c. UNIFORM REPORTING SYSTEM - INFORMATION PAMPHLET.

Provides a narrative and graphic illustration of the features and use of the Uniform Reporting System.

d. ANALYZING PERFORMANCE OF SMALL PROJECTS USING URS AND PMAS - INFORMATION PAMPHLET.

Describes how existing methods for small project reporting can be combined with analytical techniques used on large projects to effect an improvement in small project management.

e. PROJECT STATUS REPORTING AND PERFORMANCE DATA ANALYSIS - INFORMATION PAMPHLET.

Addresses basic concepts and general requirements concerning project reporting and data analysis.

4. OTHER

a. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - CHECKLIST HANDBOOK.

In handbook form provides a listing of the CSCSC and checklist questions with space for notes by DOE or industry personnel.

b. PERFORMANCE MEASUREMENT ANALYSIS SYSTEM FOR MICROCOMPUTERS

A user oriented system designed to analyze cost and schedule performance data using a microcomputer.

ATTACHMENT 3

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 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 (ACV). 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 UNPRICED WORK. The effort also for which definitized contract costs have not been agreed to but for which written authorization has been received by the contractor.

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.

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 CSCSC are being implemented. Reviews the contractor's accounting system policies and procedures for compliance with the CSCSC.

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

CONTRACTOR. The term contractor is intended to mean and include all persons, organizations, departments, divisions, and companies having contracts, agreements or a memorandum of understanding with DOE.

COST AND SCHEDULE CONTROL SYSTEMS CRITERIA (CSCSC). 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 OF MONEY. A form of indirect cost incurred by investing capital in facilities employed on government contracts.

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 CHECKLIST. A list of questions compiled by the Office of Project and Facilities Management to assist in interpreting a specific criterion. The checklist provides the basis for CSCSC use from evaluation of proposals describing a contractor's systems to onsite 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 COST. Any cost that can be specifically identified with a particular project or activity including salaries, travel, equipment and supplies directly benefitting the project or activity.

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 CSCSC IMPLEMENTATION. The application of the CSCSC to designated critical contracts. DOE formally reviews the contractor's implementation and issues a Certificate of Validation for successful contractor compliance.

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

INDIRECT COST. A cost incurred by an organization for common or joint objectives and which cannot be identified specifically with a particular project or activity. (10CFR600)

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 of sufficient national urgency, importance, size or complexity, or have normally a total estimated Government share cost in excess of $50 million in the advanced development phase of the acquisition process or $200 million over the life of the system or project.

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

MANAGEMENT RESERVE BUDGET. The portion of the contract budget base 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 CSCSC.

MODIFIED CSCSC IMPLEMENTATION. The application of the CSCSC, with less rigorous requirements for the verification and substantiation of the operation, and capabilities of the contractor's various management control systems, including organizational and work breakdown structures, their definition, levels of integration, and utilization. DOE conducts sufficient systems 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 discrete, LOE, or apportioned effort work packages.

PROJECT MANAGER. An official who has been assigned responsibility for accomplishing a specifically designated unit of work effort or group of closely related efforts established to achieve stated or designated objectives, defined tasks, or other units of related effort on a schedule for performing the stated work funded as part of the project. The project manager is responsible for the planning, controlling, and reporting of the project.

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 Office of Project and Facilities Management 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 policy for CSCSC use and application. Typical activities include assisting in overall review planning and review team selection, interpreting the CSCSC, policy and requirements, evaluating contractor earned value techniques, and consulting on review report preparation.

REVIEW TEAM. A group of representatives from the project office, field organization, Office of Project and Facilities Management, and others as appropriate, which evaluates a contractor's management control systems. Each member is 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 Office of Project and Facilities Management. 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, CSCSC. Notification by the Assistant Secretary, Management and Administration, to the contractor that the contractor has satisfactorily demonstrated full CSCSC implementation. The Assistant Secretary, Management and Administration, issues a Certificate of Validation to the contractor documenting that the contractor's systems comply with the CSCSC. Once a contractor is validated, the demonstration of systems operation upon award of a new contract (with the CSCSC 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 CSCSC 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.

- Project Summary Work Breakdown Structure (PSWBS). A summary Work Breakdown Structure tailored by project management to the specific project with the addition of the elements unique to the project. Generally, the Project Summary Work Breakdown Structure will identify project elements through the third level.

- Contract Work Breakdown Structure (CWBS). The complete Work Breakdown Summary for a contract developed and used by a contractor in accordance with the contract work statement. It extends the Project Summary Work Breakdown Structure 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:

- It represents a unit of work at levels where work is performed;
- It is clearly distinguished from all other work packages;
- It is assignable to a single organizational element and cost account;
- It has scheduled start and completion dates and interim milestones, as applicable, all of which are representative of physical accomplishment;
- It has a budget or assigned value expressed in terms of dollars, labor hours or other measurable units;
- 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
- Its duration can be integrated with higher level schedules.

WORK AUTHORIZATION. Documented approval to perform a specified activity or activities.

ATTACHMENT 4

CSCSC SOLICITATION CLAUSE

The CSCSC solicitation clause shown here is extracted from the DEAR 48 CFR Chapter 9, Subsection 952.212-73.

NOTICE OF COST AND SCHEDULE CONTROL SYSTEMS.

(a) The offeror shall submit a plan for compliance with the Cost and Schedule Control Systems Criteria (CSCSC) for the internal management control systems (cost and schedule 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. If this solicitation is intended to result in a management or operating contract as defined in the Federal Acquisition Regulation, Subpart 17.6, the offeror's plan for compliance with the CSCSC shall cover only those projects or activities so designated by the Contracting Officer elsewhere in this solicitation. The CSCSC for contractors' management control systems are set forth in DOE Order 2250.1B, Cost and Schedule Control Systems Criteria for Contract Performance Measurement. The offeror shall identify existing management control systems separately from proposed modifications to meet the CSCSC. The plan shall:

(i) describe the management control systems and their application in all major functional cost areas including 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 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 CSCSC.

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

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

(b) If the offeror is utilizing management control systems which have been previously validated by the Department of Energy or by 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 CSCSC.

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

(d) The offeror's plan for compliance with the CSCSC for management control systems will be evaluated prior to contract award. Upon validation or acceptance of the management 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 CSCSC will be by agreement between the prime contractor and the government. The prime contractor will contractually require the selected subcontractors to comply with the CSCSC. 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 the offeror's management control systems required to meet the cited CSCSC shall be made at no direct cost to the government.

ATTACHMENT 5

CSCSC CONTRACT CLAUSE

The CSCSC solicitation clause shown here is extracted from the DEAR 48 CFR Chapter 9, Subsection 952.212-73.

COST AND SCHEDULE CONTROL SYSTEMS

(a) In the performance of this contract, the contractor shall establish, maintain, and use management control systems (cost and schedule control systems) meeting the Cost and Schedule Control System Criteria (CSCSC) requirements of DOE Order 2250.1B, Cost and Schedule Control Systems Criteria for Contract Performance Measurement, annexed hereto. If this contract has been authorized as a management or operating contract in accordance with the Federal Acquisition Regulation Subpart 17.6, on those projects or contract activities designated in writing by the Contracting Officer, the contractor shall be required to establish, maintain and use cost and schedule control systems meeting the requirements of DOE Order 2250.1B. Prior to validation or 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 CSCSC. As a part of the review procedures, the contractor shall furnish the government a description of the management control systems applicable to this contract. 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 validated or accepted management control systems 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 validated or accepted 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 CSCSC, 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 ensure continuing application to this contract of the validated or accepted systems. 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 CSCSC 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 if agreed to when requested by either the prime or subcontractor.

ATTACHMENT 6

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 in accord with DOE Order 2250.1B, Cost and Schedule Control Systems Criteria for Contract Performance Measurement and the related 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)

ATTACHMENT 7

U.S. DEPARTMENT OF ENERGY

COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT

IMPLEMENTATION PLAN

FOR THE

ENERGISTICS PROJECT

January 3, 1982

I. INTRODUCTION

A. Purpose

This document provides the plan for implementation of DOE Order 225Ø.1B, COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT, on the Energistics Project.

B. Scope

This plan is applicable to all organizational elements reporting to the project manager on the Energistics Project and to all contracts in support of the Energistics Project selected for Cost and Schedule Control Systems Criteria application.

II. PARTICIPATING ORGANIZATIONS

The conduct of CSCSC activities requires the involvement, participation and coordinated efforts of the following DOE component organizations, the responsibilities and authorities of which are outlined in DOE Order 225Ø.1B.

A. Energistics Project Management

Energistics project management has responsibility and authority for the accomplishment of the procedural steps of application and implementation of CSCSC and establishment of the Energistic Project reporting requirements. The focal point in this office is E. C. Allen.

B. Assistant Secretary for Fossil Energy

The Assistant Secretary for Fossil Energy provides assistance relative to CSCSC activities as they relate to the Energistic Project including review activity and liaison with the Office of Project and Facilities Management. The individual performing this function is William L. Merchant.

C. Oak Ridge Operations Office Focal Point

The Oak Ridge Operations Office provides assistance to the Energistic Project relative to CSCSC activities as they relate to the Oak Ridge Opertions Office, supports CSCSC review activity and maintains liaison with other DOE organizations. The individual within the Oak Ridge Operations Office performing this function is Shaun R. Jackson.

D. Cognizant Contract Office (CCO)

The CCO administers the contractual activities for the Energistic Project. The CCO includes CSCSC requirements in solicitations and

contracts, participates in CSCSC reviews, and administers CSCSC matters that may affect contract performance during contract execution. The individual performing this function is Susan N. Pamella.

E. Cognizant Auditor (CA)

This is the representative of the cognizant audit organization responsible for conducting reviews of the contractor's accounting system, policies, and procedures for compliance with DOE requirements, including those related to CSCSC. The individual performing this function is George Obie.

F. Office of Project and Facilities Management (OPFM)

OPFM provides assistance relative to CSCSC activities for all DOE projects, supports CSCSC review activities, and maintains liaison with other DOE organizations. The individual within OPFM performing this function is Karl E. Stoeckle.

III. CONTENT

A. Project Summary Work Breakdown Structure (PSWBS)

The preliminary PSWBS for the Energistic Project is provided in Attachment A.

B. Contract Designations

Contracts and subcontracts for the Energistic Project are listed in Attachment B. They have been considered on an individual basis for full or modified CSCSC applications as defined in DOE 2250.1B. Proposed subcontracts are included and identified.

C. Schedule of Implementation Activities

The schedule of activities required to accomplish implementation by the designated contractors is provided in Attachment C.

D. Review Team

This is a team of qualified representatives from project management for the Energistic Project and applicable DOE components, including the CCO and cognizant auditor, that will conduct the CSCSC reviews of the contractors' management control systems. Planned review team members are listed in shown in Attachment D.

IV. REFERENCES

1. ORDERS

a. DOE 2250.1B, COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT.

Establishes the Department of Energy (DOE) policy for applying and using the CSCSC on DOE major system acquisition, major, and other projects.

b. DOE 1332.1A, UNIFORM REPORTING SYSTEM

Establishes the DOE policy for establishing reporting requirements for contracts, loans, and loan guarantees, and provides forms, formats, instructions, and procedures for reporting essential management information.

2. GUIDES

a. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - SUMMARY DESCRIPTION.

Provides an overview of the DOE CSCSC approach for contract performance measurement. It was prepared to assist both DOE and industry personnel in understanding and using the CSCSC approach properly.

b. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - IMPLEMENTATION GUIDE.

Provides uniform guidance for implementation of DOE 2250.1B. It assists both DOE and contractor representatives in fulfilling their responsibilities for meeting CSCSC requirements.

c. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - SYSTEMS REVIEW/SURVEILLANCE GUIDE.

Provides guidance to DOE personnel in conducting acceptance and validation reviews and subsequent surveillance reviews of contractors' systems to assure initial and continued compliance with the CSCSC.

d. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - CONTRACTOR REPORTING/DATA ANALYSIS GUIDE.

Provides suggested techniques for analyzing contractor cost and schedule data which should give insight into the current contract performance status and help forecast future contract performance.

e. WORK BREAKDOWN STRUCTURE GUIDE

Provides guidance for use of the work breakdown structure technique for work identification and definition.

f. UNIFORM REPORTING SYSTEM - USE OF DATA GUIDE

Provides guidance on review, analysis, and assessment of URS data.

3. INFORMATION PAMPHLETS

a. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - INFORMATION PAMPHLET.

Provides a narrative and graphic illustration of the basic concepts and general requirements of CSCSC.

b. CONTRACT PERFORMANCE MEASUREMENT REPORTING AND BASELINE MANAGEMENT - INFORMATION PAMPHLET.

Provides a narrative and graphic illustration of performance measurement reporting and baseline management.

c. COST PERFORMANCE REPORT - INFORMATION PAMPHLET

Provides a narrative and graphic illustration of the basic features of cost and schedule performance measurement reporting using the cost performance report including analysis of performance data.

d. UNIFORM REPORTING SYSTEM INFORMATION PAMPHLET

Provides a narrative and graphic illustration of the features and use of the Uniform Reporting System.

e. ANALYZING PERFORMANCE OF SMALL PROJECTS USING URS AND PMAS - INFORMATION PAMPHLET

Describes how existing methods for managing small projects can be combined with analytical techniques used on large projects to effect an improvement in small project management.

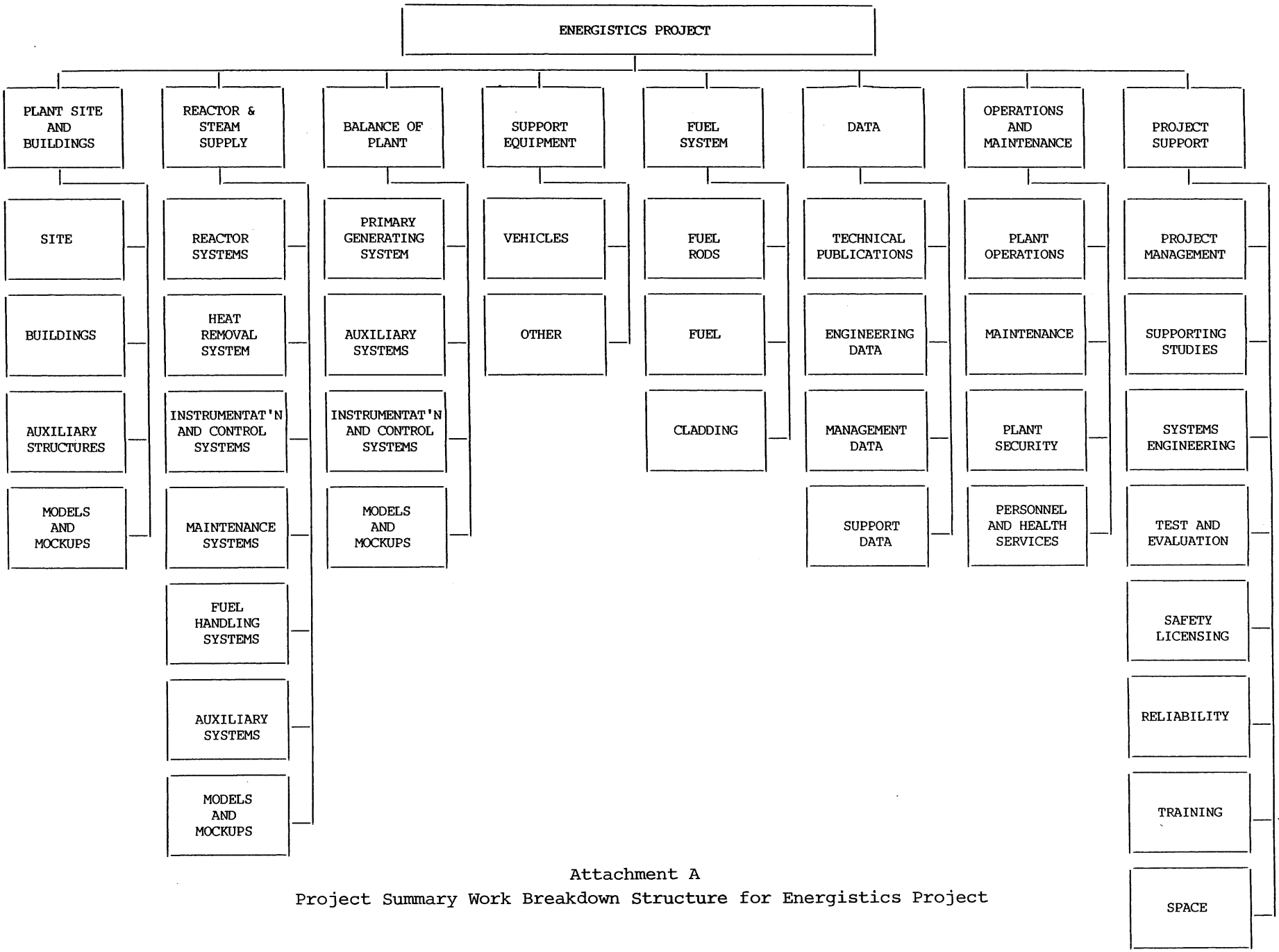
4. OTHER

a. COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT - CHECKLIST HANDBOOK.

In handbook form provides a listing of the CSCSC and checklist questions with space for notes by DOE or industry personnel.

b. PERFORMANCE MEASUREMENT ANALYSIS SYSTEM FOR MICROCOMPUTERS

A user oriented system designed to track cost and schedule performance data using a microcomputer.



Attachment A

Project Summary Work Breakdown Structure for Energistics Project

Attachment B
Energistic Project
Candidate Contracts and Subcontracts

Type of Project Activity	Contractor	Type Number[1]	Cost $ M	Cost Sharing	Full or Modified	Competed Or Not
Conceptual Design	Systems Inc. El Paso, TX	CPAF ---	5.Ø	---	F	Yes
Title I Design	Systems Inc. El Paso, TX	CPAF ---	15.Ø	---	F	Yes
Title II Design	Systems Inc. El Paso, TX	CPAF ---	4Ø.Ø	---	F	Yes
Construction	AUS	CPFF ---	292.4[2]	---	F	Yes
Electrical	TBD	CPFF ---	3Ø.Ø	---	M	Yes

[1] If awarded.

[2] Includes subcontracts.

Attachment C
CSCS Implementation Activity Schedule

1. TITLE	2. IDENTIFICATION NUMBER
Energistics	CPFF (10-10-10-2) (2222)
3. PARTICIPANT NAME AND ADDRESS	4. START DATE 1-5-82
A.U.S. Inc., Germantown, Md.	5. COMPLETION DATE 6-30-85

FULL IMPLEMENTATION

ACTIVITY/MILESTONE	YEAR	1982												1983
	MO.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.
Establish Review Team		△												
Implementation Visit		△												
Readiness Assessment						△								
Demonstration Review							△							
Corrective Actions Implemented								△						
Demonstration Review Report to OPFM									△					
First Phase I Surveillance Visit									△					
First Phase II Surveillance Visit														△

NOTES:

Attachment D

CSCSC Team Composition
Energistics Project
Contractor: A.U.S. Inc.
Contract ID: CPFF (10-10-10-2) (2222)

Implementation Visit	
Team Chief	Shaun R. Jackson
Project Management Representatives	E. C. Allen
CCO Representative	Susan N. Pamella
Cognizant Auditor Representative	George Obie
Readiness Assessment	
Team Chief	Shaun R. Jackson
Project Management Representatives	E. C. Allen T. A. Henry O. W. Joseph
CCO Representative	Susan N. Pamella
Cognizant Auditor Representative	George Obie
DOE Representative	R. G. Roberts
Demonstration Review	
Team Chief	Shaun R. Jackson
Project Management Representatives	E. C. Allen T. A. Henry O. W. Joseph
CCO Representative	Susan N. Pamella
Cognizant Auditor Representative	George Obie
Logistics/Support Specialist	R. Morris

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