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FINANCIAL MANAGEMENT RESPONSIBILITIES OF EPA PROGRAM STAFF: DEVELOPMENT OF WORK ASSIGNMENT/TASK ORDER BUDGETS

(Fifth in a Series)

This article continues a series addressing financial oversight responsibilities related to Superfund cost-reimbursement contracts that was initiated in the December 1988 edition (Number 2) of the CORAS Bulletin. The initial article introduced the series and presented a general overview of each of the areas of responsibility and the types of contracts involved. The subsequent articles presented additional details on each of the major areas of responsibility: Review and Certification of Invoices (May 1989, Number 4), Review of Contractor Work Plans (September 1989, Number 5), Review of Contractor Financial Reports and Ongoing Monitoring (December 1990, Number 10). This article, the last in the series, addresses responsibility for developing budgets for work assignments or task orders.

This sequence of articles focuses on responsibilities involved in most Superfund cost-reimbursement contracts including Field Investigation Team (FIT), Technical Assistance Team (TAT), Alternative Remedial Contract Strategy (ARCS), Environmental Services Assistance Team (ESAT) contracts, and other Superfund cost reimbursement contracts. EPA program staff responsible for financial management of these contracts include the Project Officer (PO), the Deputy Project Officer/Regional Project Officer (DPO/RPO), the Remedial Project Manager (RPM), the On-Scene Coordinator (OSC) and the Work Assignment Manager. These individuals are referred to as "contract monitors" for the purpose of describing their financial responsibilities in these articles.

Since this article focuses on development of budgets for work assignments, the discussion applies primarily to REM, ARCS and Headquarters support contracts. Although FIT, TAT and ESAT contracts do not involve issuance of work assignments, some of the concepts presented may be helpful in developing the estimates of technical hours and costs required to issue a Technical Directive type of document.

Responsibility for Independent Government Cost Estimates

In accordance with the Federal Acquisition Regulation (36.203 and 36.605), an independent government estimate of costs of construction and architect-engineer services is required for each contract or contract modification expected to exceed $25,000. It is the responsibility of contract monitors to develop the independent cost estimate during preparation of the work assignment or task order. This estimate should include a projection of the labor hours by labor category or skill level necessary to accomplish the work. Specific labor categories or task orders are defined in the contract and should be used in developing your work assignment estimate. In addition to estimating labor hours, the contract monitor should also estimate travel and other direct costs which include communications, equipment, sampling and laboratory requirements, consultants and subcontractors, printing, and computer time.

Continued on page 2

A Recent Draft Regional GAO Report Stated That:

"EPA needs to require that IGEs be developed and documented for initial budgets and subsequent cost increases. Documentation of these estimates and price negotiations is important because of staff turnover, which frequently results in regional personnel taking over management of ongoing remedial studies. A well-prepared IGE is a fundamental starting point for negotiating a reasonable price with government contractors. Having such an estimate in hand places government negotiators in a strong position to assert and sustain a defensible position and help them focus the negotiations on thorough discussions of the necessity and reasonableness of specific costs. It also reduces the risk that the contractor's proposal will be seen as the starting point for negotiations."

IGEs are important when cost reimbursement contracts are the method of contracting, because very little risk falls to the contractor and the government must be in a position to determine if the proposed resources and costs are reasonable.

The contract monitor must define the work and develop the budget without assistance from the contractor. These estimates should then be used to evaluate the reasonableness of the contractor's proposed budget in the work plan. This will help control contracting costs, eliminate unnecessary work, and ensure efficient use of resources. The remainder of this article presents the basic steps in defining the work and developing the budget and identifies several tools available to assist the contract monitor in performing these activities.

Scoping the Work

The first and most important step in preparing a work assignment or task order budget is to define the scope of work to be performed. How well the contract monitor is able to define the work will have a direct impact on the accuracy of the cost estimate. To develop a conceptual understanding of the work to be accomplished, the contract monitor should collect and review any existing information related to the assignment, drawing upon previous experience with similar assignments to help determine the magnitude and complexity of the effort. Less experienced contract monitors should seek the expertise and advice of more experienced contract monitors when developing a work assignment or task order budget.

In defining the scope of work, the contract monitor should first break the work into individual tasks, such as the fourteen standard tasks for remedial investigation/feasibility study (RI/FS) projects. Each task should be outlined in as much detail as possible. The contract monitor should evaluate the complexity of each task and identify specific requirements for each, such as functional activities to be performed, products to be delivered, and resources required for each. Identification of required resources should consider staffing requirements as well as other direct costs such as equipment and supplies. ***"Scoper's Notes,"*** which is highlighted later in this article, is of particular assistance in helping to define the scope of work for RI/FS projects, according to the standard tasks.

In scoping a remedial design (RD) project, the contract monitor should divide the work into discrete tasks, such as preparing the RD work plans and documents; evaluating data; resolving design issues; and developing preliminary, intermediate, and pre-final/final design plans. Each of these tasks can be defined further according to the functional activities to be performed. An example of defining the functional activities necessary to acquire field data and analyze samples might include subsurface explorations; mobilization/demobilization and borings; property surveys; establishment of a field laboratory; procurement of subcontracts; non-CLP analysis; data validation; and soils and materials testing. In identifying products to be delivered under the task of preparing the RD work plans and documents, the contract monitor should define several documents including a work plan, a health and safety plan, a field sampling and analysis plan, and a quality assurance plan.

While each of the tasks, functional activities, and products may be similar for all sites, each site may have unique characteristics that require an individual evaluation of the resources necessary to complete the RD. In order to determine the needed resources, each of the tasks should be evaluated for a specific site to determine the expected complexity of accomplishing the task and identify any unique obstacles that might impact the completion of the task. The contract monitor should also consider factors such as the amount of detail required in each of the design documents and the level of expertise needed to evaluate the data and develop the documents. By dividing the work into discrete tasks and defining each functional activity and product in as much detail as possible, the contract monitor can more accurately estimate the labor hours required to accomplish the work at an individual site.

Estimating Labor Hours

The second step in developing the budget is to determine the level of effort required for each task defined in the scope of work. This determination, which is generally the most difficult one, should be based on the nature and difficulty of the task. The contract monitor should use his/her best professional judgement, historical data, and similar scope work assignments to identify the full range of labor resources needed to complete the task. The contract monitor may want to develop high and low estimates initially. The monitor should consider the learning curve of the contractor staff, subcontractor involvement, the level of task complexity, and any other factors which may influence upward or downward adjustments.

Each task should be evaluated in order to estimate the number of hours or level of effort (LOE) required by each professional or technical labor category as well as develop an estimate of clerical hours. In estimating the hours, the contract monitor should assess the need for involvement of senior contractor staff or specialized technical expertise. If the complexity of the task does not warrant more experienced technical resources, the majority of hours should be estimated at the lower skill levels. This underscores the importance of a thorough assessment of the technical skills and hours required in relationship to the complexity of the scope of work. Reviewing previous work assignments with a similar scope may provide valuable insight into the development of these level-of-effort estimates.

Developing Cost Estimates

Once the contract monitor has scoped the work and developed estimates of labor hours for the work assignment, the final step of developing the cost estimate is relatively straightforward. To develop a detailed cost estimate, the contract monitor uses the specific labor hour estimates by labor category developed previously. The total hours per labor category can be multiplied by the loaded hourly rate for that category under the specific contract. The loaded hourly rate has been adjusted to include costs for fringe benefits and overhead. Other direct cost estimates can be developed by detailing task requirements such as the number and location of trips, the number and volume of reports, the involvement of subcontractors and special consultants, and the need for special equipment or computer time. Costs can be computed for each of these requirements based on averages from past experience or from established cost parameters such as per diem travel costs. The Project Officer or the Contracting Officer should be consulted for assistance in estimating costs for other direct costs as well as providing information on any specific cost parameters defined by the contract. When information is not available, the contract monitor should define and apply conservative assumptions in order to estimate the costs.

From the detailed breakdown of estimated costs, the contract monitor can compare the independent government cost estimates with the contractor's proposed budget in the work plan, highlighting and evaluating the reasonableness of any discrepancies. In order to make this comparison, the contract monitor should require the contractor to submit the work plan cost estimates broken down by the same tasks and cost categories as the independent government cost estimates. Comparison of the two cost estimates provides an informed basis for evaluating specific costs and negotiating with the contractor concerning any cost discrepancies.

While an understanding of the method of calculating the costs is useful, various tools are available which may assist the contract monitor in developing these estimates. Several of the tools currently available to contract monitors are describe below.

Budget Development Tools

To assist the contract monitor in estimating work assignment costs, several tools have been developed. These tools provide varying degrees of complexity and can provide valuable assistance in performing the different steps required to develop work assignment budgets. While "Scoper's Notes" provides useful assistance in scoping RI/FS tasks and developing an average range of costs based on site complexity and historical experience, the Scheduling and Cost Estimating Expert System (SCEES) provides a more sophisticated computer model for estimating costs for RI/FS tasks at non-complex sites. The Cost of Remedial Action (CORA) Model provides a computer model which evaluates alternative remedial action technologies at a site and computes cost estimates based on past experience with the application of these technologies. The Remedial Action Bid Tabulation Database provides historical data on remedial action costs at similar sites for comparison purposes. The Work Assignment Resources Planning (WARP) program provides assistance in computing total work assignment cost estimates based on resource projections and in contract-specific rates. Each of these tools is discussed

more detail below and presented in the following exhibit.

BUDGET DEVELOPMENT TOOLS

Tool	Phase	Directive/ Publication	Contact
Scoper's Notes	RI/FS	EPA/540/G-90/002 February 1990	Paul Wilkins 202-382-2462
SCEES	RI/FS	OSWER Directive 9355.0-29 8/13/90	HSCD
CORA	RA	OSWER Publication 9375.5-06/FS April 1990	Kirby Biggs 703-308-8506
Bid Tabulation Database	RA	N/A	Florence Blair 703-308-8327
WARP	N/A	N/A	Region II Shaheer Alvi 212-264-2221 Keith Moncino 212-264-9300

Scoper's Notes

"Scoper's Notes" is a small handbook, available through CERI, that serves as a guide to estimating RI/FS costs. The handbook provides suggestions for scoping the work, including potential questions to ask and information resources to review. RI/FS projects are divided into the fourteen standard tasks with estimated cost ranges for each task based on relative complexity. These cost estimates were developed through analysis of technical requirements, past experience, and professional judgement. The handbook provides checklists that the contract monitor can use to help assess the complexity of the work and to evaluate and estimate the costs of each task.

"Scoper's Notes" also highlights primary cost driving factors and provides hints for minimizing these, including maximizing the use of existing data, careful consideration of the size and number of water sampling wells to be installed, and increased use of on-site sample analysis. The handbook concludes with a list of several additional references, which provide more detail on conducting RI/FS projects.

The handbook is designed to give the inexperienced RPM a starting point for determining site complexity and other factors that can have a material impact on the costs for completing the project. The checklists help the contract monitor develop initial cost estimates that can be used to evaluate the contractor's work plan estimate. The level of effort and costs presented in the handbook are intended to be a starting point that can be adjusted to accommodate the unique characteristics of the specific project. The handbook is not intended to provide hard and fast guidelines on costs for RI/FS projects, but to be a tool for evaluating the relative complexity and cost of a project compared to past experience.

"Scoper's Notes" provides a handy tool that can be carried on site and used to guide the RPM through consideration of the site characteristics and related costs. The weakness of the handbook is the fact that the data were compiled from RI/FS costs at 80 sites which are now a couple of years old. These costs, therefore, do not take into consideration any changes that have occurred in overall costs due to factors such as increased emphasis on risk assessment activities. In addition, the costs at the sites used were not readily available by task and had to be recreated based on estimated break outs by task.

Scheduling and Cost Estimating Expert System (SCEES)

SCEES is a computer-based model designed to predict cost estimates for RI/FS tasks at non-complex landfill, pond, and lagoon sites. The user enters data into the system based on responses to questions on a work sheet concerning site-specific factors. The system uses general site information and HRS scores combined with historical data based on costs at 80 sites, expert knowledge, project planning data, and policy/risk assessment information to estimate the site complexity, costs, and scheduling. Costs are provided as aggregate estimates as well as estimates for each of the 14 standard RI/FS tasks. The model also selects remedial technologies and evaluates RI/FS task alternatives or reductions and the associated cost savings and risk.

The system generates four summary reports for a site. The first report details the best estimate of LOE and costs for each of the 14 tasks. A second report is a site data report that rates site complexity and provides estimates of the number of media samples, surveys, and tests to be conducted during the field investigation task. This report also lists the remedial technologies that are indicated for evaluation. The third report details drilling requirements, including a summary of the number, casing, depth, and sampling requirements

for wells that are to be installed and an estimate of the LOE and cost of drilling. The fourth report provides a summary of the RI/FS costs likely to be required to complete the project, including labor, equipment, travel, and subcontractor costs. This report also indicates an estimate of the Contractor Laboratory Program costs that are implied by the number of samples and types of analyses planned. The model requires approximately an hour to run and produces the summary reports for each site.

SCEES has been distributed to each region, providing a useful tool for estimating the LOE and costs of an RI/FS based on a large body of historical data. The model allows the user to customize the data geographically by incorporating local drilling and contractor costs. The information that is required to run the model successfully is data that are readily available to the contract monitor as a result of the HRS scoring process. The model requires some knowledge of the site in order to input the necessary site information and requires periodic updating of the resource files. SCEES is particularly well suited for developing costs estimates for landfill, pond, or lagoon sites but has limited usefulness for other types of sites.

Cost of Remedial Action (CORA) Model

CORA is a model that is designed to assist in planning and budgeting for remedial actions at Superfund sites. The system is intended for use prior to or during the remedial investigation stage of the cleanup. The model helps select remedial action technologies and provides preliminary cost estimates of the remedial action based on the selected scenario. CORA is a computerized model consisting of two independent subsystems: an expert system and a cost system.

The expert system uses site information to recommend a range of remedial actions from among 42 different technologies. To obtain the required information concerning the site and types of waste present, the system poses questions to the user. Based on the user's responses, the system analyzes the site and offers recommendations for the remedy. The analysis is based on technology-specific engineering expertise, statute interpretations, and policy issues. The system allows the user to vary responses to questions and thereby perform sensitivity analyses by evaluating alternative outcomes.

The cost system uses the response action scenarios developed by the expert system or other sources to determine order-of-magnitude cost estimates, ranging from -30% to +50%. Costs estimates are detailed by site, operable unit, scenario, and technology, with the system calculating cost estimates for capital and first-year operation and maintenance for each technology selected. The system generates a summary report for a site or operable unit that details costs by construction and operation of individual unit processes and operations, costs for specific activities, and bid and scope contingencies.

The model is particularly useful in developing order-of-magnitude estimates when other data are limited. The model provides a means of developing cost estimates which is consistent, widely used and accepted, and has been validated. It is useful in evaluating established technologies, providing a comprehensive list of costs. Several factors limit the usefulness of the model for developing independent government cost estimates. The model may not provide accurate enough estimates, particularly for more complex actions such as groundwater cleanup and excavation due to a greater variability of costs under different scenarios. In addition, the model has limited ability to tailor the estimates to consider regional cost differentials and considers a limited set of technologies. The model also requires a significant amount of site-specific data in order to develop reliable estimates.

Remedial Action Bid Tabulation Database

Superfund remedial action bid information has been compiled into a database to assist RPMs in developing cost estimates. Information on approximately 52 sites is currently included in the database. Site information consists of a description of the site, clean-up levels, and technologies used. The database currently identifies 36 different technologies. Cost data for each site include the Record of Decision (ROD) estimate, the engineer's estimate prior to requesting bids, and the contractor bids received. If the site is complete, the database also includes costs resulting from change orders. The contractor's bid data are broken down by costs for each task line item presented in the bid.

The database can be queried by site name, by technologies used, or by region. The contract monitor can use the database to identify sites with similar characteristics by technology and region and can print the cost data for a specific site. These cost data detail each bidder's estimated cost per line item and identify the bidders by rank order of the total bid. This cost

Continued on page 8

KEY REGIONAL PERSONNEL IN SUPERFUND CONTRACT MANAGEMENT

Contract	Headquarters (PO, DPO if possible)	Region 1	Region 2	Region 3	Region 4
REM	REM I - Tracy Loy, EMAIL5201 REM II - Tracy Loy, EMAIL5201 REM III - Tracy Loy, EMAIL5201 308-8349 REM IV - Florence Blair, EMAIL5201	Nancy Barmakian, 833-1797 EMAIL9170 U.S. EPA, HCP-CAN7 JFK Federal Building Boston, MA 02203	Shaheer Alvi, 264-2221 EMAIL9204 U.S. EPA 26 Federal Plaza New York, NY 10278	James McKenzie, 597-3229 EMAIL93035 U.S. EPA 841 Chestnut Street Philadelphia, PA 19107	Ken Myer, 257-2930 EMAIL U.S. EPA 345 Courtland St., N.E. Atlanta, GA 30365
ARCS	Bill Zobel, EMAIL 308-8346 Barbara McDonough, EMAIL 308-8348	Nancy Barmakian, 833-1797 EMAIL9170 Diane Kelley, 833-1672 EMAIL9171 U.S. EPA, HCP-CAN7 JFK Federal Building Boston, MA 02203	Jill Hacker, 264-4197 EMAIL Fernando Rosado, 264-6130 EMAIL Keith Kollar, 264-1576 EMAIL Keith Moncino, 264-9300 EMAIL U.S. EPA 26 Federal Plaza New York, NY 10278	Elaine Spiewak, 597-3229 EMAIL James McKenzie, 597-3229 EMAIL93035 U.S. EPA 841 Chestnut Street Philadelphia, PA 19107	Matt Robbins, 257-2930 EMAIL9428 Doug Thompson, 257-2234 EMAIL Charles Swan, 257-2234 EMAIL U.S. EPA 345 Courtland St., N.E. Atlanta, GA 30365
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KEY REGIONAL PERSONNEL IN SUPERFUND CONTRACT MANAGEMENT

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information can be used to develop cost estimates based on historical experience at similar sites in the same geographical region.

The database, which is currently available in each regional office, is particularly useful in providing actual costs of remedial actions for comparison since the data are based on actual historical experience at sites rather than cost estimates. The database, however, is currently limited to costs at 52 sites. This finite number of sites may provide only a limited sample of costs for any specific technology and any specific region. This limitation will decrease in significance as more sites are added to the database.

Work Assignment Resources Planning (WARP)

WARP is a menu-driven application program that calculates the total estimated cost of a work assignment based on estimated resource data entered by the user and generates detailed costs reports. The program is also capable of estimating the cost of individual amendments to a work assignment. The WARP program calculates contract costs using algorithms based on contractual terms and conditions of a cost plus award fee contract. The program can be used to calculate costs for work assignments under contracts which use level-of-effort hours categorized by standard professional and technical levels.

The user supplies input data through a series of data entry screens. Data are required for each team member on the contract which includes pricing data consisting of hourly rates for each labor category, fees, overhead, and general and administrative (G & A) costs. For each work assignment and defined task, the user enters estimated resources required, broken out by labor hours for each labor category and other direct costs detailed by travel, postage, telephone, supplies, reproduction, reports, computer, mobile lab, materials and supplies, and subcontract pool. Based on these data, the program computes costs including calculation of the base and award fees for each team member and the prime contractor's fee for managing the work performed by the subcontractors. The user can conduct evaluations of alternative cost scenarios by changing data inputs related to labor hour distributions or other direct cost estimates.

The program generates several different cost reports by work assignment, by amendment, and by contractor or subcontractor. The reports provide labor breakdown tables by task and labor category, and cost estimate breakdown tables by task and cost category. In addition, the WARP program generates the Optional Form 60 reports which are required with the submission of contract pricing proposals for work assignments. The cost information can also be downloaded and imported into a LOTUS spreadsheet.

The WARP program provides a reliable cost database, incorporating actual contractor and subcontractor labor, overhead, and G & A rates as well as fees. From this cost data, the program allows the user to quickly develop labor breakdown tables and detailed cost estimates and to generate the Optional Form-60. The program is user friendly and does not require the user to know the intricacies of cost estimating. The WARP program, however, is only applicable to those contracts that have the same indirect cost rate structure. Use of the program for contracts with a different rate structure requires modification of the program using algebra and fee adjustments.

The most important thing to remember in developing work assignment or task order budgets is that the government is responsible for evaluating the reasonableness of contractor's cost estimates and actual cost expenditures. This requires the contract monitor to develop an independent government cost estimate in enough detail to identify areas of unnecessary costs and inefficiencies. The budget development tools described in this article can provide valuable assistance in fulfilling this responsibility.

CORAS BULLETIN BOARD

Hazardous Site Control Division

The Hazardous Site Control Division has an iniative underway to prepare guidance on the development of cost estimates for remedial design. The guideline will provide information on estimating labor hours for designs that range from simple to complex for several different categories of remedies. The document will also include guidelines for estimating other direct costs typically associated with remedial design. The guidance, while covering design cost estimating, is to be a comprehensive document that will encompass all other facets of scoping remedial design, including: the collection of pre-design technical information; the development of a remedial management strategy and schedule; and, the preparation of a design statement of work. The first draft of the guidance should be available in the Fall.

If you are interested in receiving back issues of the CORAS Bulletin, please call Jalania Ellis, FTS 475-8533.

For any changes to the "Key Regional Personnel in Superfund Contract Management" chart please notify Jalania Ellis, FTS 475-8533.

We want your feedback!

If you have future articles for the CORAS Bulletin, please submit them to:

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