



DEFENSE COMMUNICATIONS AGENCY
WASHINGTON, D.C. 20305-2000

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DCA CIRCULAR 600-60-1
Change 5

8 August 1990

ANALYSIS

Defense Communications Agency
Cost and Planning Factors Manual

1. DCA Circular 600-60-1, 4 March 1983, is changed as follows:

REMOVE PAGES

xvii through xx
24-37 through 24-57

I-9

INSERT PAGES

xvii through xx
24-37 through 24-60

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The changed portions are indicated by number signs (#) in the left margin of the new pages.

2. When the above action has been completed, this change may be filed with the basic publication.

FOR THE DIRECTOR:

1 Enclosure a/s


EDWARD J. HENDERSON, JR.
Colonel, USAF
Chief of Staff

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TABLE 24-14. ANNUAL REQUIREMENTS FOR #2 FUEL OIL FOR HEATING

Location	Number of Gallons Per Year Per Cubic Foot		
	Unoccupied Space (55°)		Occupied Space (65°)
	Not Insulated	Fully Insulated	Fully Insulated
Tropics (except high altitudes)	0	0	0
Southern United States, near coastal areas	.0024	.0016	.0177
Gulf Coast States, coastal States from VA south, and CA; Tokyo, Japan, and Southern Japan; Mediterranean coastal areas in Europe; and Southern England	.0222	.0131	.0791
Northern England, Germany and Southern Europe, Northern Japan (except mountainous terrain in all locations); Continental U.S. south of and including RI, PA, IN, KS, NM, AZ	.0297	.0180	.0891
Southern Canada and Northern U.S. except Rocky Mtn. areas; Scandinavian Countries; European mountainous areas except U.S.S.R. and Swiss Alps	.0521	.0335	.1337
Point Barrow, AK, and extremely mountainous areas		.0965	.2954
Source: DCA Code 690/NAV Docks MO-303 Exhibit 4-4 and V, dated 23 Aug 71; current as of 16 Jan 76, DCA/CEC.			

5. Contractor Employees.a. General.

(1) Guidance for estimating the cost of DCA support contracts is provided herein. Contractor employees fill key roles as professional engineers and consultants as well as provide site supervision and administrative and technical services. Tables 24-15 through 24-18 contain costs for their services, which include the following:

- (a) Salary.
- (b) Overhead and general and administrative (G&A) expenses.
- (c) Profit or fee.

(2) Travel costs are additive.

(3) The four general classes of service of DCA support contracts for which cost factors have been developed are as follows:

- (a) Test and Evaluation Technical Support
- (b) SETA (System Engineering and Technical Assistance)
- (c) ADP:
 - 1. Technical support services
 - 2. System software integration test and evaluation
 - 3. Hardware maintenance/software support
 - 4. Software maintenance and development
- (d) O & M Studies

b. Salaries are affected by the geographical areas where work is to be done and by union activities. These differences may be significant; therefore, salaries contained herein should be used only when actual rates for the area concerned are not known.

c. Use of Tables.

(1) Determine the number and type of personnel required to perform necessary functions in terms of staff-months, then multiply by the appropriate monthly rates from tables 24-15 thru 24-18. Basic rates of pay are shown as well as loaded rates, which include charges for contractor overhead, G&A, and fee (profit).

(2) Transportation costs for contractor personnel are not contained in the annual pay rates.

d. Estimating Procedures.

(1) Determine from the specifications contained in the work statement or program description the kind of work to be done.

(2) Next determine the personnel requirements in staff-months. Segregate the types of personnel required (e.g., engineers, technicians, and clerical support).

(3) Multiply the number of staff-months for each kind of personnel by its monthly rate. If neither the basic rates nor the loading factors are known, use the fully loaded rates. Both components are shown in case some actual data is available.

e. Example.

(1) There is a requirement to estimate the costs of an ADP technical support contract. It is estimated that the development of the program will require over 8 staff-years of effort.

(2) The first step in making the estimate is to determine the time and skills needed for each phase of the requirement. This can be done as follows:

<u>Program Management</u>	<u>Hours</u>
Senior Systems Engineer	930
<u>Automated Command & Control Evaluation System Support</u>	
Senior Systems Engineer	300
Senior Systems Analyst II	1860
Software Analyst	630
<u>Automated Configuration Management Integration Syst Supp</u>	
Senior Systems Engineer	300
Senior Systems Analyst I	930
Software Analyst	2304
Data Analyst	744
<u>Automated Unbundled Software Management Systems Support</u>	
Senior Systems Engineer	30
Software Analyst	342

Incident Control Center Operations

	<u>Hours</u>
Senior System Engineer	300
Senior System Analyst I	930
Software Analyst	2304
Data Analyst	1116

Task Order

Senior Systems Analyst III	1860
Systems Analyst II	1107
Director of Engineering	288

(3) Using the time shown above and labor rates shown in table 24-18, a cost estimate that does not include the application of indirect costs (overhead at 62% and G&A at 15%) and fee (at 10%) will be:

<u>Labor</u>	<u>Hours</u>		<u>Staff hrs</u> <u>Per Month</u>	<u>Staff</u> <u>Months</u>	<u>Labor Rate</u> <u>Per Staff</u> <u>Month</u>	<u>Labor Costs</u>
Sen. Sys. Eng.	1860	-	156	= 11.92 x	\$ 4,887	= \$ 58,253
Sen. Sys. Anal. I	1860		156	11.92	4,187	49,909
Sen. Sys. Anal. II	1860		156	11.92	3,987	47,525
Sen. Sys. Anal. III	1860		156	11.92	3,660	43,627
Sys. Anal. II	1107		156	7.10	3,159	22,429
Software Anal.	5580		156	35.77	2,934	104,949
Data Analyst	1860		156	11.92	2,176	25,938
Director of Eng.	288		156	1.85	7,001	12,952
	16275			104.32		365,582
Sec./Tech Editor	1300		156	8.33	2,020	16,827
Total	17575			112.65		\$382,409
						=====

Other Direct Costs

Travel	\$ 8,262
	=====

(4) The fully loaded cost in 1990 dollars would be:

$$\begin{array}{rcl}
 (\$382,409 \times 1.62 \times 1.15 \times 1.1) & + & (\$8,262 \times 1.15 \times 1.1) = \\
 \$783,671 & + & \$10,451 = \$794,122.
 \end{array}$$

(5) Use Chapter 38 to inflate beyond 1991.

TABLE 24-15. CONTRACTOR LABOR RATES -
TEST AND EVALUATION TECHNICAL SUPPORT

Occupational Category	CY 90		CY 91	
	Basic Monthly Rate	Fully Loaded Monthly Rate	Basic Monthly Basic	Fully Loaded Monthly Rate
Senior Engineer ¹	\$4,479	\$10,503	\$4,703	\$11,028
Engineer	2,663	6,245	2,796	6,557
Technician ²	1,727	4,050	1,813	4,251
<u>Loading Factors³</u>				
	Overhead		87%	
	G&A		14%	
	Award Fee		10%	
	Technical Staff Month		156 hours	

NOTES - ¹Senior engineer category also includes managerial personnel.
²Technician category also includes non-exempt personnel such as secretaries and graphics personnel.
³Loading does not consider other direct costs such as travel, material, reproduction, etc.

Source: DCA/PMC, March 1990

TABLE 24-16. CONTRACTOR LABOR RATES -
SETA CONTRACTS

Occupational Category	CY 90		CY 91	
	Basic Monthly Rate	Fully Loaded Monthly Rate	Basic Monthly Rate	Fully Loaded Monthly Rate
Clerical	\$1,329	\$2,891	\$1,395	\$3,036
Technical Publications	2,118	4,608	2,224	4,839
Administrative Services	1,570	3,416	1,648	3,586
Program Control Representative	1,671	3,635	1,754	3,816
Senior Member Advisory Staff	3,625	7,887	3,806	8,282
Member/Advisory Staff	3,353	7,295	3,520	7,660
Senior Member Technical Staff ¹	2,853	6,207	2,996	6,518
Member Technical Staff ²	2,464	5,362	2,587	5,630
Senior Technical Assistant	1,664	3,621	1,747	3,802
<u>Loading Factors³</u>				
Overhead (Plant Site)	85%			
G&A	8.5%			
Award Fee	8.4%			
Technical Staff Month	156 hours			

NOTES - ¹A senior member of technical staff is responsible for performing technical work of a high professional level using both standard and non-standard analysis, design, and programming methods and techniques. Requires a BS/BA degree with a minimum of 6 years of professional experience. Also an MS is preferred.

²A member of the technical staff can include a programmer/analyst. The person is responsible for performing technical work at a professional level using both standard and non-standard design and advanced programming techniques. This person conducts detailed analysis and study of all system requirements and develops methods for problem solving, producing high-level system flow-charts and/or associated documentation. This position requires a BS/BA degree and a minimum of 4 years of professional experience.

³Loading does not consider other direct costs such as travel, material, reproduction, etc.

Source: DCA/PMC, March 1990

TABLE 24-17. CONTRACTOR LABOR COSTS -
CONTRACTUAL TECHNICAL ASSISTANCE

Occupational Category	CY 90		CY 91	
	Basic Monthly Rate	Fully Loaded Monthly Rate	Basic Monthly Rate	Fully Loaded Monthly Rate
"B" Level Engineer ¹	\$4,885	\$12,712	\$5,130	\$13,347
"C" Level Engineer ²	4,087	10,635	4,291	11,166
"D" Level Engineer ³	3,443	8,959	3,615	9,407
"E" Level Engineer ⁴	2,907	7,564	3,052	7,942
"F" Level Engineer ⁵	2,625	6,831	2,757	7,173
"G" Level Engineer ⁶	2,352	6,120	2,470	6,426
"H" Level Engineer ⁷	3,323	8,646	3,489	9,078
PS1 Level Project Support ⁸	2,450	6,374	2,572	6,692
PS2 Level Project Support ⁹	1,965	5,114	2,064	5,370
PS3 Level Project Support ¹⁰	1,437	3,739	1,509	3,927
<u>Loading Factors¹¹</u>				
Overhead			95%	
G&A			19.2%	
FCCM (Facilities Capital Cost of Money)			2.7%	
Award Fee			9.0%	
Technical Staff Month			156 hours	

NOTES - ¹B Level - 12 years of experience plus bachelor's degree in either engineering, math, physics, computer science, telecommunications, operations research or statistics.
²C Level - 9 years of experience plus bachelor's degree in fields cited for B level.
³D Level - 6 years of experience plus bachelor's degree in fields cited for B level.
⁴E Level - 3 years of experience plus bachelor's degree in fields cited for B level.
⁵F Level - bachelor's degree in scientific discipline.
⁶G Level - associate degree in scientific discipline.
⁷H Level - high school graduate with formal technical training
⁸PS1 Level - 5 years experience plus bachelor's degree. The types that fall under this level are secretary, security officer, graphics supervisor, technical editor.
⁹PS2 Level - high school graduate with formal training as a secretary/administrative training
¹⁰PS3 Level - high school graduate with two years or less entry level clerical experience.
¹¹Loading does not consider other direct costs such as travel, material, reproduction, etc.

Source: DCA/PMC, March 1990

TABLE 24-18. CONTRACTOR LABOR COSTS -
ADP SUPPORT AND TECHNICAL SUPPORT

Occupational Category	CY 90		CY 91	
	Basic Monthly Rate	Fully Loaded Monthly Rate	Basic Monthly Rate	Fully Loaded Monthly Rate
Senior Systems Engineer	\$4,887	\$10,015	\$5,151	\$10,515
Senior Systems Analyst I	4,187	8,580	4,396	9,009
Senior Systems Analyst II	3,987	8,171	4,186	8,578
Senior Systems Analyst III	3,660	7,500	3,843	7,875
Systems Analyst II	3,159	6,474	3,317	6,798
Software Analyst	2,934	6,013	3,081	6,314
Data Analyst	2,176	4,459	2,285	4,683
Secretary	2,020	4,140	2,121	4,347
Director of Engineer	7,001	14,347	7,351	15,064

<u>Loading Factors¹</u>	
Overhead	62%
G&A	15%
Award Fee	10%
Technical Staff Month	156 hours

NOTES: ¹Loading does not consider other direct costs such as travel, material, reproduction, etc.

Source: DCA/PMC, March 1990

f. Temporary Services

(1) In February 1990 the Office of Personnel Management (OPM) authorized the use of private sector temporary services by federal agencies to meet short-term temporary needs.

(2) Services may be used only when needs cannot be met through temporary appointment procedures or use of current staff.

(3) Need may be based on any of the following:

- (a) An emergency
- (b) A pressing necessity
- (c) An exigency

(4) The following are not sufficient enough reasons to hire private sector temporary help:

- (a) Vacation
- (b) Recurring cyclical workloads
- (c) Other circumstances not compelling

(5) Terms and conditions

(a) 95% of temporaries must have at least a secret clearance. Uncleared personnel will be allowed to work only in those areas which do not require a clearance.

(b) The Contracting Office may place delivery orders over the phone. If the contractor is unable to fill the order in two working days, the contract will go to the next source.

(6) Temporary personnel are employees of the contractor. They may not be recruited, tested, selected, rewarded, reassigned, granted leave, disciplined, or separated by the federal agency that hired them.

(7) The contractor furnishes training, insurance, bonding, security clearances, recruiting, and transportation.

(8) Special conditions

(a) The government reserves the right to reject employees who do not meet the required skills.

(b) No one employee may work for more than 45 working days in a 6-month period. If the need continues, the federal agency may secure the services of a different individual from the firm. When temporary services are needed for maternity absence, a request can be made to OPM for an extension of the same individual for 20 working days.

(c) Temporary personnel are paid for the hours they work. Any work in excess of 40 hours per week is considered overtime and is not authorized under these contracts.

TABLE 24-19. TEMPORARY SERVICES LABOR COSTS

	<u>Price Per Hour</u>		
	<u>Kelly Temporary Services</u>	<u>Norrell</u>	<u>Careers USA</u>
Secretary-Level I	\$13.10	\$15.70	\$14.65
Secretary-Level II	14.25	17.10	15.90
Secretary-Level III	15.63	18.80	17.50
Clerk-Typist	11.50	14.73	12.25
Management Assistant	14.05	-	-
Librarian	15.96	-	-
Writer-Editor	15.02	-	-
Computer Programmer	19.85	-	-
Computer Systems Analyst	18.84	-	-
Television Production Specialist	18.68	-	-
Visual Information Specialist	18.68	-	-
Communication Specialist	15.50	-	-

NOTES: Base year = 1990.
Source: DCA/PMR

g. Independent Government Cost Estimate for Scientific,
Engineering, and Technical Support Contracts.

(1) General.

(a) This paragraph provides guidance for the preparation of independent Government planning and budget cost estimates for contracts providing management and scientific analysis, and engineering and technical support. The use of the suggested formats is not mandatory, unless so stated by other DCA documents. This paragraph does not apply to contracts for the acquisition of hardware, for the operation of communications systems, nor for the maintenance of these systems. It does apply to contracts that are labor-intensive and usually involve only small amounts of material and equipment.

(b) If no new contract is being considered, but rather a continuing effort, use actual cost figures, adjusted for changes in price levels and in scope of work. The actual cost figures can be compared to the original independent Government estimate to help improve the estimating process and to point out areas where more cost control is needed. If a new contract is planned to be awarded by Sole Source to a known contractor, the best estimating method is analogy with current and past efforts of the same contractor. Again, adjustments for price level changes must be made. If the work will be done by an FFRDC contractor or is similar to that done by an FFRDC contractor, see paragraph (6), below. Otherwise it is best to use the method detailed below. Even in the above three cases, it is beneficial to also use the following method as it enforces a more thorough consideration of cost.

(c) The cost estimate is based on the Statement of Work (SOW) which describes the tasks to be performed (see DCAI 260-70-3, Project Monitor's Handbook for the Preparation and Processing of Acquisition Actions, chapter 6). The SOW provides a link between the Government's requirement and the corresponding cost. First, the total contract price is estimated, using the categories: Direct Labor Charges (DLC), Indirect Labor Charges (ILC), Other Direct Charges (ODC), General and Administrative (G&A), and Fee, described in paragraph (3), below. These costs are then distributed over the performance years of the proposed contract. Finally, the time-phased costs are adjusted to include the effects of inflation on budgetary estimates.

(d) Cost estimating for these contracts begins with an analysis of the stated requirements to determine the categories of effort and the quantity of each category of effort the project tasks will require. The office preparing the SOW must describe the requirement specifically but without needlessly going into the details of the contractor's approach to the tasks. The requirement should be divided

into well-defined tasks and an end product described for each. Examples of end products include milestone schedules, literature reviews, block diagrams of computer programs, functional specifications for switching devices, and working prototypes of an item. Some suggestions are provided below on relating the tasks identified above to the corresponding labor requirements.

1. Decide whether the tasks and their interrelationships are simple or complex. Decide also whether the tasks are state-of-the-art or routine. A literature review or interviews may be required.

2. Decide on a unit of measure for labor. For estimating purposes the concept of a Technical Staff Month (TSM) is suggested. A TSM is defined as 1 month of a professional, technical, or scientific person's time directed to the performance of the tasks in the SOW. TSM should not include general management or supervision unless the supervisor or manager is assigned and identified to the individual project; nonproductive time, such as leave and holidays; and administrative, secretarial, clerical, and graphics support personnel. The costs for these items are included in ILC (see paragraph (3)(b), below).

3. Meet with previous Contracting Officer's Technical Representatives (COTR's) experienced in similar work and review the contracts to help quantify the relationship between the level of contractor staffing and the corresponding outputs for the proposed tasks. Review of this historical data is easier to accomplish and provides a more accurate estimate of TSM if the project has been divided into well-defined tasks. Exercise caution when using historical data to estimate TSM, especially when contracts are not very similar or the tasks are state-of-the-art R&D efforts. Consider also that the relationship between the number of TSM required and project size is not a linear one. Large projects require additional TSM for integration and coordination requirements.

4. Reference texts that address requirements definition and methods for estimating TSM requirements are available in the DCA Technical Library and the DCEC Technical Library. However, regardless of the method used to estimate the TSM, the estimate still relies heavily on expert judgment.

5. At the end of this phase, the project monitor should have a planning estimate for the categories and amounts of TSM required and also a preliminary project schedule. The Independent Cost Estimate Worksheet can now be completed.

11 (2) Derivation of Factors.

(a) The salaries in table 24-20 were adapted from Bureau of Labor Statistics and National Society of Professional Engineers salary surveys. The use of more relevant salary data, when available, is encouraged.

TABLE 24-20. CONTRACTOR SALARIES FOR
SCIENTIFIC, ENGINEERING, AND TECHNICAL SUPPORT

TABLE 24-20. CONTRACTOR SALARIES FOR SCIENTIFIC, ENGINEERING, AND TECHNICAL SUPPORT			
		<u>Total Cost</u>	
	<u>Monthly Salary</u>	<u>ILC Factor = 1.20</u>	<u>ILC Factor = 1.50</u>
<u>Engineers</u>			
Senior Engineers	\$5,774	\$15,790	\$17,944
Midlevel Engineers	4,520	12,362	14,047
Junior Engineers	3,466	9,479	10,772
<u>System Analysts</u>			
Senior Analysts	4,777	13,064	14,845
Midlevel Analysts	3,975	10,871	12,354
Junior Analysts	3,333	9,114	10,357
<u>Programmers</u>			
Senior Programmers	3,422	9,357	10,633
Junior Programmers	2,377	6,499	7,385
<u>Engineering Technicians</u>			
Senior Technicians	2,638	7,214	8,197
Junior Technicians	1,898	5,190	5,898
NOTE: Total cost uses G&A rate of 13% and Fee rate of 10%.			
Source: 1989 NSPE Income and Salary Survey and 1989 BLS Survey, validated by DCA contract experience, both updated to FY 1990.			

(b) The loading factors below for Indirect Labor Charges, G&A, and Fee were developed from a study of task order contracts.

(3) Preparation of Independent Government Estimates. The Independent Cost Estimate Worksheet (figure 24-3) is used to prepare independent estimates of scientific, engineering, and technical support contract costs. It provides guidance for calculating Direct Labor Costs (DLC), Indirect Labor Costs (ILC), Other Direct Costs (ODC), G&A, Contractors' Fee, and Total Cost. The average cost per TSM is also calculated on this worksheet to allow convenient comparison to other contractual efforts.

(a) To calculate DLC, enter the number of TSM's required for each category of effort identified. Using table 24-20, determine the monthly salary level for each category of effort identified. Multiply the TSM by the monthly salary and sum the results to arrive at the DLC.

(b) Indirect Labor Charges (ILC) include all labor costs chargeable to the contract other than the salaries of the professional, technical, and scientific persons included under DLC above. ILC covers the salaries of the administrative, secretarial, clerical, and graphics support personnel. ILC also covers the employee benefits, social security, workmen's compensation, and an amount for nonproductive time for all persons charged to this contract. Experience has shown that ILC varies greatly depending on the presence of competition and the degree to which management is included in direct labor charges, as well as other factors. Table 24-21 offers suggested ILC rates. For planning purposes, without better information such as prior contracts for very similar work, use table 24-21. Use lower rates for Senior Engineers and Analysts or when space, equipment, or computer time is being furnished by the Government. Multiply DLC by the rate to determine ILC.

(c) Other Direct Charges (ODC) cover travel (including transportation, per diem, and rental cars), material, equipment, ADP, consulting, subcontracts, and other items. These items can only be identified and priced after development of a more specific knowledge of the required tasks. Many of these items can be priced by using readily available sources (e.g., airline fares, equipment catalog prices, rental car schedules). ADP equipment prices can be found in Datapro reports or other reference sources.

(d) General and Administrative (G&A) charges cover companywide costs (for example, office space and insurance) that the contractor will allocate to the contract. G&A in recent contracts is usually about 13 percent of the total of DLC, ILC, and ODC. However, values outside this range are also observed. For planning, unless better information is available, use the formula:

$$\text{G\&A} = .13 \times (\text{DLC} + \text{ILC} + \text{ODC})$$

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INDEPENDENT GOVERNMENT COST ESTIMATE (IGCE)				
Enter the program and cost data on this form and perform the calculations. Information on filling out this form and assistance in developing input data is available in OCA Circular 600-60-1, Chapter 24.				
1. PROGRAM DATA				
a. Program Name: _____ b. Reference No.: _____ c. Date: _____ d. Costs estimated in constant FY: _____ Dollars				
2. COST ESTIMATING FACTORS:				
a. Indirect Labor Charge (ILC) factor = _____ b. General & Administrative (G&A) factor = _____ c. Fee Rate (Profit) factor = _____				
3. DIRECT LABOR CHARGE (DLC) = TSM x MONTHLY SALARY				
Category of Labor	Technician Staff Months (TSM)	x	Monthly Salary	= Total Salary
_____	_____	x	_____	= _____
_____	_____	x	_____	= _____
_____	_____	x	_____	= _____
_____	_____	x	_____	= _____
_____	_____	x	_____	= _____
Total (TSM) = _____			TOTAL DLC = _____	
4. INDIRECT LABOR CHARGE (ILC) = DLC x ILC FACTOR				
			TOTAL ILC = _____	
5. OTHER DIRECT CHARGES (ODC)				
		TYPE	AMOUNT	
		Travel _____	= _____	
		Material _____	= _____	
		Equipment _____	= _____	
		ADP _____	= _____	
		Subcontract _____	= _____	
		Other (Specify) _____	= _____	
		Other (Specify) _____	= _____	
			TOTAL ODC = _____	
6. G&A = (DLC + ILC + ODC) x G&A FACTOR				
			TOTAL G&A = _____	
7. FEE = (DLC + ILC + ODC + G&A) x FEE RATE				
			TOTAL FEE = _____	
8. TOTAL IGCE = DLC + ILC + ODC + G&A + FEE				
			TOTAL COST = _____	
9. AVG. \$/TSM = ((DLC + ILC) x (1 + G&A FACTOR) (1 + FEE RATE))/TSM				

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FIGURE 24-3. INDEPENDENT COST ESTIMATE WORKSHEET

TABLE 24-21. ILC FACTORS FOR SCIENTIFIC, ENGINEERING,
AND TECHNICAL SUPPORT CONTRACTS

<u>Category</u>	<u>ILC Factor</u>
Full and open competition, Management not in Direct Labor	1.20
Less competition available, Management not in Direct Labor	1.5
Full and open competition, Management in Direct Labor	.9125
Less competition available, Management in Direct Labor	1.174

Source: DCA/PM and DCA/CEC, 1987.

(e) The fee covers the profit or fee to the contractor. The amount for fee is subject to negotiation and depends on the degree of contractor risk, the value of contractor facilities, and other factors. The DCA contracts researched were of the cost-plus-fixed-fee type (low risk to the contractor), and the fee ranged in the area of 10 percent of the total cost of DLC, ILC, ODC, and G&A. For planning, unless better information is available, use the formula:

$$\text{Fee} = .10 \times (\text{DLC} + \text{ILC} + \text{ODC} + \text{G\&A})$$

(4) Time-Phasing the Planning Estimate. For budget purposes the cost figures derived above on the Independent Cost Estimate worksheet must be distributed over the duration of the contract and also adjusted for inflation. Paragraph (a) below tells how to spread these constant dollars over the duration of contract performance, and paragraph (b) below tells how to adjust the time-phased, constant-dollar costs to include the effects of inflation during the contract period.

(a) First, spread the total constant-dollar amount into specific amounts for each fiscal year. For DLC and ILC, use proportions. Allocate the dollars for these elements in each fiscal year proportional to the number of TSM to be expended in that year. Projects that take place entirely in 1

fiscal year do not have to be time-phased. The SOW may suggest how quickly the tasks are to be performed (for example, a surge effort with minimal follow-on, or alternatively, an even level of effort throughout). For ODC, the time phasing requires a knowledge of each of the items and when they are required. The time phasing of G&A and Fee can be based on the same proportions as were used for DLC, ILC, and ODC, above. After spreading these costs over the fiscal years of the contract (i.e., before adjusting to include the effects of inflation) the total amount should be the same as the total constant-dollar amount originally developed.

(b) For budget purposes it is necessary to calculate the Total Obligation Authority (TOA) required in each fiscal year. The TOA figures are developed from the time-phased, constant-dollar costs developed in paragraph (a), by adjusting for the effects of price level changes and outlay rates. Table 38-3 (Weighted Price Level Indexes) gives a specific index for each fiscal year. The following formula is used:

$$TOA = \text{Constant Dollar Costs} \times \text{Index}/100$$

Chapter 38 provides further discussion on how to use these indexes.

(5) Example, Using Worksheet To Prepare Planning Estimate.

(a) Using data and scenarios prepared by DCA, the contractor will analyze the capability of a proposed hardened cable communications network to endure several types of natural disasters, such as earthquake and fire. Several types of cable will be provided as Government Furnished Material (GFM), and the contractor will perform testing at the contractor's own facility, assumed in this example to be a local one. It is not possible to specify exactly how many tests will be run, because the plan requires that the contractor use an iterative search procedure in which the results of each stage are analyzed before deciding how to continue. There will be, however, not fewer than 12 and not more than 36 tests. The contract will start at the beginning of the third quarter of FY 1991 and run for 2 years. Costs for this example will be estimated first in constant FY 1990 dollars. Then the TOA will be calculated.

(b) An Independent Government Cost Estimate (IGCE) is to be calculated for the contract. The Indirect Labor Charge Factor, obtained from table 24-21, is 1.20; the General and Administrative (G&A) Factor is 0.13, and the Fee Rate (Profit) Factor is 0.10. These factors are entered under Cost Estimating Factors on the IGCE form as shown in Figure 24-4. On the basis of the Statement of Work and a knowledge of similar projects, a contractor is expected to assign four professionals, each devoting half his or her time to this project (the other half to another, unrelated project). There might be a midlevel engineer, two junior engineers, and a senior technician. Figure 24-4 each. Monthly salaries from table 24-20 are entered under Direct Labor Charges. Indirect labor charges are calculated by multiplying total direct under Direct Labor shows the types of effort and the number of months for

INDEPENDENT GOVERNMENT COST ESTIMATE (IGCE)				
Enter the program and cost data on this form and perform the calculations. Information on filling out this form and assistance in developing input data is available in OCA Circular 600-60-1, Chapter 24.				
1. PROGRAM DATA				
a. Program Name:	<u>Hardened Cable Example</u>			
b. Reference No.:	<u>R890-1234</u>	c. Date:	<u>6/25/90</u>	
d. Costs estimated in constant FY:	<u>1990</u>	Dollars		
2. COST ESTIMATING FACTORS:				
a. Indirect Labor Charge (ILC) factor	=	<u>1.20</u>		
b. General & Administrative (G&A) factor	=	<u>0.13</u>		
c. Fee Rate (Profit) factor	=	<u>0.10</u>		
3. DIRECT LABOR CHARGE (DLC) = TSM x MONTHLY SALARY				
Category of Labor	Technician Staff Months (TSM)	x	Monthly Salary	Total Salary
<u>Mid Level Eng</u>	<u>12</u>	x	<u>\$4,520</u>	<u>\$54,240</u>
<u>Jr Eng</u>	<u>24</u>	x	<u>3,466</u>	<u>83,184</u>
<u>Sr Technician</u>	<u>12</u>	x	<u>2,638</u>	<u>31,656</u>
		x		
		x		
Total (TSM) = <u>48</u>			TOTAL DLC = <u>\$169,080</u>	
4. INDIRECT LABOR CHARGE (ILC) = DLC x ILC FACTOR			TOTAL ILC = <u>\$202,896</u>	
5. OTHER DIRECT CHARGES (ODC)				
	TYPE	=	AMOUNT	
Travel	=		<u>\$0</u>	
Material	=		<u>0</u>	
Equipment	=		<u>0</u>	
ADP	=		<u>0</u>	
Subcontract	=		<u>0</u>	
Other (Specify)	=		<u>0</u>	
Other (Specify)	=		<u>0</u>	
			TOTAL ODC = <u>\$ 0</u>	
6. G&A = (DLC + ILC + ODC) x G&A FACTOR			TOTAL G&A = <u>\$ 48,357</u>	
7. FEE = (DLC + ILC + ODC + G&A) x FEE RATE			TOTAL FEE = <u>\$ 42,033</u>	
8. TOTAL IGCE = DLC + ILC + ODC + G&A + FEE			TOTAL COST = <u>\$462,366</u>	
9. AVG. \$/TSM = (DLC + ILC) x (1 + G&A FACTOR) (1 + FEE RATE) / TSM			= <u>\$ 9,633</u>	

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EXAMPLE FOR ILLUSTRATIVE PURPOSES

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FIGURE 24-4. HARDENED CABLE EXAMPLE

labor charge (line 3) by the ILC factor (line 2a). Since the contractor will use GFM at the local facility, the contract should have no material or travel. The contractor should already have any necessary test equipment. Other Direct Charges, then, are estimated at zero. G&A amount is calculated by multiplying total direct labor charge (line 3) by the G&A factor (line 2b). Fee amount is calculated by multiplying direct labor charge (line 3) by the fee factor (line 2c). The total contract cost estimate is the total of direct labor charge, the indirect labor charge, the other direct labor charges, the G&A amount and the fee amount. In the example, the total contract cost estimate, in constant dollars, is then \$462,366, as shown on line 8 of figure 24-4.

(c) A constant level of effort is assumed for this contract, which runs for eight quarters -- two in FY 1991, four in FY 1992, and two in FY 1993. The use of proportions (one-eighth of the constant-dollar total in each quarter) gives time-phased constant-dollar costs as follows:

Fiscal Year	FY 1991	FY 1992	FY 1993	Total
Cost (Constant FY 1990 \$)	\$115,592	\$231,183	\$115,592	\$462,366

(d) The Total Obligation Authority for this example is calculated by using the RDT&E indexes from an FY 1990 base year version of table 38-3 of this manual. First divide these indexes by 100, and then multiply the constant-dollar costs above as follows:

Fiscal Year	FY 1991	FY 1992	FY 1993	Total
Cost (Constant FY 1990 \$)	\$ 115,592	\$231,183	\$115,592	
Index	1.042	1.084	1.124	
TOA (Current \$)	\$ 120,447	\$250,602	\$129,925	\$500,974

The Total Obligation Authority is presented on DCA Form 9: Summary Sheet.

(6) Federally Funded Research and Development Centers. There are six Federally Funded Research and Development Centers (FFRDC's), four of which are used by DCA as shown in table 24-22. These are nonprofit organizations primarily engaged in providing independent specialized technical and scientific support to DoD. FFRDC's charge a fixed fee per TSM (table 24-22). This is a loaded fee that includes ILC, G&A, and Fee discussed previously.

(a) To prepare an independent estimate for an FFRDC contract effort, the types and amounts of effort required to perform the tasks are identified in the SOW as described in paragraph (1)(c) above.

(b) Multiply the total number of TSM required by the cost per TSM from table 24-22.

(c) Use the Independent Cost Estimate Worksheet to complete the estimate. Use zero as the Indirect Labor Charge Factor (in section 2), as the costs for these items are included in table 24-22.

(d) Time phasing of planning estimates for FFRDC's is accomplished as described in paragraph (4).

TABLE 24-22. FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

<u>FFRDC</u>	<u>Fee per TSM</u>
Institute for Defense Analysis (IDA)	\$14,067
Lincoln Labs	15,317
MITRE	
CONUS	12,712
Europe	13,546
Pacific	15,630
AEROSPACE	16,464
NOTE: Base year is FY 1990.	
Source: DCA/CEC, Jun 90.	

(7) Computerized Version of Form 752. A computerized version of DCA Form 752 (Figure 24-3) has been developed to assist in the preparation of an Independent Government Cost Estimate. This new form, 752(E), is programmed for use with a Lotus 1-2-3 spreadsheet. The input data is identical to that for the original form that is described on the previous pages. The Lotus 1-2-3 program performs all the calculations and prints a complete estimate that can be included with program documentation. If desired, copies of the program are available from DCA/CEC located in DCA headquarters. Phone number is AV 222-6913, commercial (202) 692-6913.

6. Security Clearances.

a. General. The U.S. Government incurs expenses for investigations of all personnel who require access to information which has been classified in the interests of national security. Investigations of employees of, and contractors for, the military departments and defense agencies are conducted by the Defense Investigative Service (DIS).

b. Derivation of Costs. Table 24-23 presents average costs for Special Background Investigations (SBI), Background Investigations (BI), and Periodic Reinvestigations (PR) on DCA personnel. Included are costs of "full field" DIS investigations and National Agency Checks, as well as Security Division costs associated with converting investigations into clearances. Periodic reinvestigations are updates conducted on individuals at 5-year intervals. To determine a recurring annual cost, divide the cost indicated in the table by 5.

When an overseas check is required for military personnel, it is conducted by the applicable military department.

TABLE 24-23. SECURITY CLEARANCE COSTS

<u>Item</u>	<u>Cost</u>
Special Background Investigation	\$691
Background Investigation	463
Periodic Reinvestigation	463
Overseas Check	50

Source: DIS, DCA/BZ, Mar 85.

7. Miscellaneous O&M Factors.

a. Building Maintenance

(1) General. This paragraph covers the recurring annual costs for building maintenance normally funded from the O&M appropriation. These costs include recurring supplies, materials, and other minor equipment items for the repair and maintenance of buildings and other structures, grounds, roadways, parking lots, and foundations. Also included are support for custodial and protective services, fire reporting, and security alarm system maintenance. Excluded are military and civilian U.S. employees' pay and allowances. Minor construction projects costing \$25,000 or less funded from the operations and maintenance funds are included; however, DoD policy forbids the military departments to augment major communication construction projects with O&M project funds. Storage and supply buildings supporting communication facilities should be included in the basic construction costs, even though costing \$25,000 or less.

(2) Use of Table. A cost factor found in table 24-24 should be applied to the estimated initial cost of communications buildings and facilities to estimate the annual cost of building maintenance. The analyst must determine if the construction index should be applied to adjust the estimated costs selected for the geographical area. Construction cost indexes are contained in chapter 36.

(3) Example 1. The buildings and facilities of an LOS microwave system to be built in the northern area of Michigan are estimated to cost \$285,200.

$\$285,200 \times .05 \times 1.15 = \$16,399$ per year building maintenance.

(4) Example 2. The buildings in an existing microwave system actually cost \$300,000 to construct. (When actual cost is available, the construction index factor does not apply.)

$\$300,000 \times .05 = \$15,000$ per year building maintenance.

b. Supplies and Equipment.

(1) General. This topic addresses the recurring annual costs for supplies and equipment normally funded from the O&M appropriation. More specifically, this element includes the cost of supplies, material, repair parts, equipment assemblies, and clothing or other expendable equipment consumed in the operation and maintenance of communications mission equipment. Excluded are "investment" type items contained in chapter 25 or spares costing over \$1,000 per item of issue; POL products costed in this chapter, paragraph 4, "Utilities and POL"; and supplies or equipment utilized by the host base in performing support functions, such as building and grounds maintenance and operation and maintenance of vehicles covered in paragraphs a and c. The supplies and equipment costed in this element are the recurring annual costs funded in the communications organization budgets, to include the base communication applicable costs. The supplies and equipment encompass associated supplies, material, clothing, furniture, fixtures (not affixed), safety items, tools, machinery, chemicals, instruments, and apparatus.

(2) Use of Table. Determine the costs of mission, auxiliary, test, peculiar, and common support equipment. Add together and multiply by the factor found in table 24-24.

(3) Example. LOS communication, auxiliary, test, and support equipment at a site are estimated to cost \$857,000.

$\$857,000 \times .03 = \$25,710$ per year recurring O&M cost.

c. Military Base Contractual Services. These services exclude DECCO leases, depot level maintenance, and contractor-operated bases or sites.

(1) General.

(a) Costs reviewed encompassed the following:

1. Data processing (PCAM, EAM) and computer equipment leases not obtained through DECCO.

2. Rental of reproducing equipment.

3. Communication contract services, such as service contracts, telephone ringers, and alarms, unless obtained through DECCO.

4. Other leased equipment, such as cranes.

5. Postage and post office boxes.

6. Purchased equipment maintenance.

7. Printing and reproduction.

(b) A factor has been developed for those portions of the above services, such as crane leases and repair of air conditioners, pertinent to an LOS site supported by a host base. If normal base support is not available, the percentage will increase.

(2) Use of Table. Multiply the appropriate factor in table 24-24 by the estimated cost of the equipment. Communication units, detachments, and squadrons receive base support from the closest military installation.

(3) Estimating Procedure. Determine the cost of the prime mission, auxiliary, test, and support equipment and estimate the availability of base support.

(4) Example. LOS total equipment costing \$857,000 requires contractual support available from a host base.

$$\$857,000 \times .003 = \$2,571 \text{ annual cost}$$

d. Contractor-Operated Base Markups.

(1) General. A review of current contracts revealed a wide range of contractual support costs. It is necessary to include personnel costs. Costs for engineering and key personnel of the contractor, as shown in Tables 24-15 thru 24-18, already incorporate these support costs.

(2) Use of Table. Table 24-24 contains cost factors and instructions as to application of the markup to cost estimates developed in accordance with other parts of this Circular; e.g., cost markup on salaries or material purchase prices. These factors should be used only when the salaries of personnel or material purchase prices exclude overhead and miscellaneous support costs.

(3) Estimating Procedure.

(a) Consider the type of personnel trained to operate the transmission media as well as the climatic factors, the geographical area, and the political situation of the foreign country. When adequate personnel are available from a nearby city, the amount of required personnel housing and other support will decrease. Conversely, if the base is to be operated in a

remote desert, all personnel support must be included in the base facility complex. The estimate must incorporate the contractor's cost and overhead and profit. Contractor costs are subject to, and directly affected by, the foreign country's political situation and customs, a factor difficult to evaluate but necessary to consider.

(b) Use the basic factors and block diagrams available in this Circular for estimating equipment, supplies, spare parts, other material, transportation, etc., anticipated to be furnished by contract. Separately identify the subtotals of the various categories of cost; apply the overhead factors to the categories; compute the direct costs which include personnel overhead; apply the additional factor for overhead, taxes and profits; and total. Determine the appropriate totals and apply the factors in table 24-24.

TABLE 24-24. MISCELLANEOUS O&M FACTORS

<u>Item</u>	<u>Markup</u>	<u>Percentage</u>
<u>Annual Costs</u>		
Maintenance and Acquisition of Buildings		5 %
Supplies and Equipment		3
<u>Military Base Contractual Services (excludes DECCO and contractor-operated base)</u>		
Host-Tenant Support Available		0.3
Host-Tenant Support Not Available		1
<u>Contractor-Operated Base Markups</u>		
Personnel Overhead: Increase Salaries for Civilians (U.S. or foreign)		25
Processing and Handling of Materials: Increase Total Purchase Price		6
Other Overhead: Increase Total for Direct Cost Plus Above Percentage Markups		5
U.S. Taxes and Profit: Increase All Costs and Prior Markups		10

Source: DCA/CEC, current as of Mar 85.